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ABSTRACT

British polytechnics, or technical institutes, are considered from a range of perspectives. Papers include: higher education in the 1970's (C.F. Carter); polytechnic administration (including its relation to government agencies, personnel, academic structure, and financial and plant administration) (C.S. Hall); polytechnic costing: some problems (C.J. Harris); a critical appraisal of systems of organization (V. Pereira Mendoza); the relationship of research and consultancy to courses and resources (A. Walker); and the Council for National Academic Awards and the polytechnics (A.M. Ridler). (MSE)

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Coombe Lodge Report

Vol 8 No. 9

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Polytechnic Perspectives

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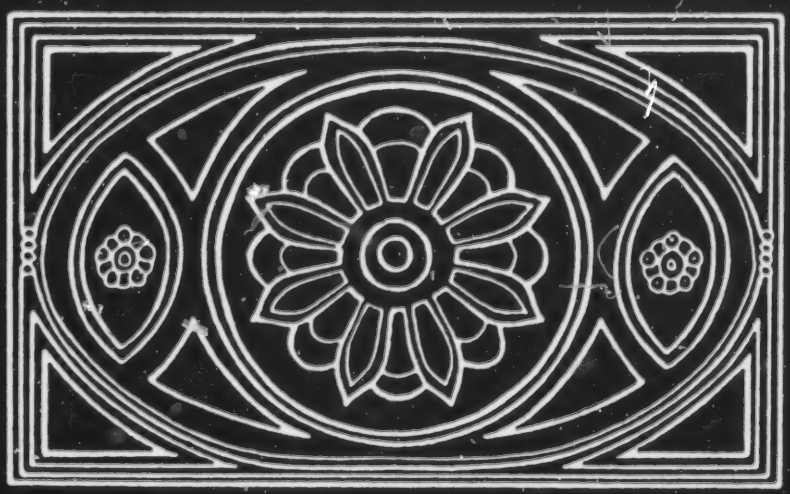

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Collection of Papers

CONTENTS

Foreword 596

Higher Education in the 1970's. 587
Dr C F Carter, Vice-Chancellor, University of Lancaster.

Polytechnic Administration. 603
C S Hall, Chief Administrative Officer, Bristol Polytechnic.

Polytechnic Costing - Some Problems 612
C J Harris, Finance Officer, Polytechnic of North London.

A Critical Appraisal of Systems of Organisation on Polytechnics. 617
V Pereira Mendoza, Director, Polytechnic of the South Bank.

The Relationship of Research and Consultancy to Courses and Resources. 635
A Walker, Head of Department of Surveying, Liverpool Polytechnic.

CNAA and the Polytechnics 641
Mrs A M Ridler, Senior Assistant Registrar, Arts & Social Studies, CNAA.

FOREWORD

In the papers collected in this report polytechnics are considered from a range of perspectives. Mr. Carter reviews the spectrum of higher education provision in the 1970s and the place of the polytechnics within this overall context. Mrs. Ridler describes the interaction of the polytechnics with one of their most important external influences, the CNAA. The remaining papers consider more internal problems. Mr. Hall discusses administration, Mr. Pereira-Mendoza looks at systems of organisation and Mr. Harris, in a short paper, raises some pertinent questions about costing. The relationship of research and consultancy to courses and resources in polytechnics is reviewed by Mr. Walker, drawing on his experience in surveying departments.

Dr C F Carter,
Vice-Chancellor,
University of
Lancaster.

HIGHER EDUCATION IN THE 1970's

"Higher Education in Britain is at the present time a rather complicated, expensive and wasteful business, whose purposes are obscure and muddled. In order to see how this has happened, it is necessary to look back at the position in the early 1960's, when we were, of course, having various kinds of economic crisis. But in those days we knew what to do about it. We would use the admitted superiority of British brains, our most valuable indigenous raw material, and the special qualities of British education; in a world whose advanced countries compete by high technology, we would excel and be victorious. At the same time, the general advance of higher education would enable us to build a better society, to conquer long-standing social problems, and to enrich people's lives. Such generalities enabled us to dodge the awkward implications of the fact that most of those entering higher education would be totally unsuited to advance high technology.

misjudgements of the 1960's

A caricature, perhaps: but not an unrecognisable one. It is a consequence of the expectations of that period that we have expanded places in science and technology far beyond the demand for them, thus making what is necessarily costly even costlier. Two things went wrong with our calculations. In seeking to use education as an economic instrument - which in itself was open to question - we seriously misjudged the nature of the problem which we were trying to solve. To excel in high technology we needed, first, business men capable of applying scientific management techniques; second, applied scientists with the skill to pull in, and adapt to our circumstances, ideas arising in the 98% of the world which is not Britain; third, far more people with scientific training who would work in the management of production (rather than research); and lastly a considerably increased number of higher-grade technicians. We had no reason to suppose that the educational system was failing to recognise infant Einsteins; but they would anyway be very few, and what we needed in considerable numbers were people who would not be original researchers, but who had developed certain kinds of practical quality. And, above all, we needed better business men in enterprises of every size, because without them there would be no proper development of demand for the work of the applied scientists, the production men and the technicians.

A general stimulation of degree work in science and technology was too vague a programme to achieve these ends, even if one allows also for the development of the business schools. But it was in any case certain to be a partial failure, because of our blindness to the state of the schools which still continues. For a considerable time we had been recruiting to the school-teaching profession, alongside some able and dedicated men and women, a sizeable group taken from the least able of the entrants to higher education; in fact, as a recent study has shown, of a lower ability than those who, being qualified, do not enter higher education at all. The difficulties of recruitment were, and remain, particularly serious in science and mathematics. This fact, taken together with a general

malaise and uncertainty about standards in secondary education, was sufficient to ensure, not only that there would be a lack of entrants to higher education qualified to pursue science and technology, but also that many potential entrants would have acquired a positive distaste for technological careers. Mathematics, in particular, loses out in a time when learning is supposed to be fun, for worthwhile mathematical learning must be hard work. It is almost impossible, in higher education, to overcome the early fear of mathematics, the consciousness of impending disaster whenever one tries to do it.

vocational education

As the hopes of the 1960's have receded, they have not been replaced by any clear new understanding of what higher education is supposed to be about - apart from those sectors which are unambiguously vocational, like medicine and teacher education. But even in the vocational sectors, we have a dismal record of miscalculation. Whatever we believe that the country can afford in the way of better staffing for its schools - and I doubt if we can afford very much until our main economic problems are solved - it is undeniable, not only that teacher education is very much overexpanded, but that we allowed this overexpansion to persist for some three years after the time when a change of course should have been made. Consequently we are now trying, in a hurry, to close some colleges and cut others by more than a half; since the position of the staff has to be protected, the result will be an enormous rise in the real cost of teacher training, which will no doubt be carefully concealed in the statistics. At thesame time, we are spending freely to correct an earlier miscalculation about the required number of doctors; the pressure of a desperate shortage of social workers will probably cause us to move into overproduction within a few years; there is already some danger of the present shortage of planners becoming an excess; and the provision of law degrees is likely to run beyond professional requirements.

The dilemma about vocational courses arises from an interaction of flows and stocks. Consider, for instance, a profession with 100, 000 members, making good its wastage from death, retirement, marriage and transfer by a steady inflow of 3, 000 a year. Some change of policy or external circumstances increases the requirement to 120, 000. There is immediately a desperate shortage - only 3, 000 coming forward, where 23, 000 are needed. In an attempt to overcome this, training facilities are doubled. Initially this makes things worse, because the stock of teachers has to be doubled and this will probably be done by extracting people from the profession. But in eight or nine years the shortage will have been overcome, and the training facilities will then be 67% higher than the replacement demand - indeed, for a period almost double the replacement demand, because the additional 20, 000 in the profession will be young and not many will leave. However, if the teachers are specialists and cannot be sacked, so that the stock of teachers declines only very slowly, we shall find ourselves either continuing the over-production until enough potential students realise that it will lead to unemployment, or running the teaching system at high cost and low productivity.

One moral from this is that we should try to avoid crash programmes, and have the patience to change things gradually. But another one may be plucked from the last of my examples of potential over-production, that of Law. An excellent case can be made for a legal education as a general training in habits of exact thinking, quite apart from its professional uses. It would plainly be too expensive to have medical schools profucing non-doctors, or even engineering departments producing non-engineers; but it is not ridiculous to take advantage of the uncertain boundary between the vocational and non-vocational uses of a subject like Law, which is not particularly expensive, to protect ourselves from the problems which arise in exclusively vocational courses.

general education

But, once away from the illusionary safety of known vocational requirements, how are we to decide how many should receive higher education? It is not much use saying 'all who are qualified and want to take part'. Qualified for what? One would expect, a priori, that the number capable of benefitting significantly by one year of higher education would exceed those capable of benefitting by two, which in turn would exceed the number capable of benefitting by a three-year degree course. But, instead of allowing the pyramid to taper off evenly, we distort it by under-providing one and two year courses, and we then define the qualifications for entry to higher education to fit the provision we have made as closely as we can manage. There is really no reason to believe that a two-A-level standard defines those who 'are qualified for' or 'can benefit from' higher education. We are busy excluding from higher education the five-O-level entry which was the staple of many teacher training colleges (and which, for the most part, is not very suitable for the other sub-degree-level courses which exist). Do we really believe that they 'could not benefit' from higher education?

The fact is that, in the field of general education, we are providing what we can get the public to pay for; and, there being a vestigial prestige attaching to degrees, we give our main attention to the development of degree courses. But I doubt if the public enthusiasm for paying for degrees is strong enough to survive at its present level through the next major economic crisis. In their capacity as fathers and mothers the members of the public have produced a significant minority of illiterate layabouts who waste the opportunities of higher education, and of student extremists who pervert those opportunities to the disturbance and harm of others. The public, being somewhat dissatisfied with its handiwork, does not see why it should pay taxes to put it through a process which shows little sign of improving it. It believes, and perhaps rightly, that the malaise of youth is more likely to be cured by an early subjection to the process of earning one's living than by taking courses in sociology.

The danger in which we are put by this belief is that the reaction will be stronger than is warranted by the disease of a minority - a danger enhanced by the fact that, not just in Britain but across much of the world, the desire to enter higher education has been declining, and this offers an additional excuse for cutting back. The cut-back could well go to a point at which initiatives with a perfectly sensible vocational purpose are inhibited, and well-balanced

hard-working students are deprived of opportunities for higher education which they fully deserve. So we need to be more forthright in reminding the public that higher education is not just about producing enough dentists to give quick service to our aching teeth, but also about maintaining and improving the quality of our civilisation; and that Britain's efforts in this field are sadly deficient by international standards. Do we really want the first Elizabethan age to be remembered for Shakespeare, but the second for the Beatles?

universities and polytechnics

I have said nothing so far about the relation of universities to polytechnics. This is because most of the things said about this relation appear to me to be fallacious, being based on ill-supported generalisations about two very various groups of institutions. Thus, it is not true that universities are 'pure' and polytechnics 'applied'; the universities, in fact, probably have a rather higher proportion of vocational courses at degree level. A university like Leeds corresponds to the folk-image in universities of what polytechnics are like; the actual mixture of subjects in some polytechnics is much nearer to Essex, with a heavy proportion of the social sciences. There is no evidence at all that polytechnics are more 'responsive to social demand', though they may be more responsive to official pressure. The problem in running a university is to stop one's staff jumping on every passing bandwagon, that is to say, being over-responsive to social demand at the cost of good order and educational principle. There is no evidence that polytechnics are cheaper, if one compares like with like; they appear to be, at present, a good deal more expensive, but no-one has ever been allowed access to the data for doing a proper comparison.

This is not to say that there are no differences. The polytechnics, or some of them, have a real attachment to a mixture of degree and sub-degree level work; that is a good thing, worth preserving. They are more oriented towards teaching, though for some reason the time freed by doing much less research does not seem to be reflected by a more economical staff-student ratio; what appears to happen is that there are more contact-hours per student, which may reflect differences in the nature of the student recruitment. Most important, the polytechnics have a different system of government, considerably inferior from the point of view of the staff (unless one excuses it as the price of getting more money), much less efficient, but very desirable to those Civil Servants who want unseen control of education and who have resented the autonomy of the universities.

It is an illusion sometimes believed in Elizabeth House that autonomy is equivalent to doing just what one wants, and is synonymous with wastefulness and chaos. This is an example of the device of attributing to your opponent views which he does not hold, in order that you may knock them down - the Aunt Sally technique. None of us in the autonomous sector believe that we should be handed large amounts of public money to do just what we like with; it is fully accepted that there must be strong advice ('do this or you won't be well treated in future') and that some kinds of spending must simply be prohibited. The essence of autonomy is trusting people to get on with a job without detailed regulation, and to find for themselves

the most efficient way of doing it; and not believing that Governments, or H M Inspectors, or Regional Advisory Committees are necessarily right. Autonomy exists in part to protect dissent from the 'conventional wisdom', and to allow experiment with alternative ideas and assumptions.

Having the public and the autonomous sectors side by side, but kept firmly apart by official policy, increases confusion and waste in higher education. Two half-full departments are equipped and maintained, where one would do: expensive support facilities are duplicated: plans for new courses go ahead in ignorance of the fact that similar plans are being developed a mile away. Yet until recently practical moves towards coordination have been firmly prevented; for instance, when I proposed that my university and its nearest polytechnic should have separate but overlapping Governing Bodies, so that we might know a little about each other's intentions, the idea was regarded as quite impossible. Coordination has however remained possible between universities, or polytechnics, and their related colleges of education; and one gathers that Government policy is currently changing so as to lessen the divisions of the binary system. Not before time: many millions of pounds have been wasted in unnecessary competition.

junior colleges

If I had been in charge of higher education, I would have sought to create (perhaps from the surplus assets of the teacher training system) a network of Junior Colleges offering two-year Diplomas of Higher Education; for these Diplomas will never flourish as a subsidiary enterprise in institutions mainly interested in degree work. I would then have tried to bring together regional or local groupings of institutions - a university, a polytechnic, some colleges of education and junior colleges, perhaps one or two other colleges with a large amount of advanced work. Each such cluster would be organised and treated as an autonomous institution, with a block grant from a central Grants Committee, but would be expected to work out a sensible division of functions and sharing of facilities between its members, with proper arrangements to allow students to transfer from less advanced to more advanced work, or to change their line of interest. The cluster would, for instance, have one main research library, with satellite teaching libraries: a single computer service: coordinated media services.

It would be expected to offer to its neighbourhood certain kinds of public service, eg. advisory and testing services to firms. There would be differentiation of institutions by function, but no class distinctions in the amenities provided for students. The national system would deal simultaneously with all types of higher education, in a rolling five-year plan; it would necessarily make assumptions about numbers of students to be provided for, but would engage in guidance rather than direction in the detail of what is provided.

Fortunately I never shall be in charge of higher education, so this is not a programme for the 1970's, or for the 1980's either. What is in fact in store for us, in the remainder of this decade, is a continuing and very serious limitation of resources in all sectors, gravely threatening the quality of our work, while at the same time the waste and muddle created by fifteen years of bad policies will continue, and we shall be blamed for some of their consequences. I do not find the 1970's an attractive decade for higher education."

C S Hall,
Chief Administrative
Officer, Bristol
Polytechnic.

POLYTECHNIC ADMINISTRATION

"It may not be too grotesque an extension of Shaw's maxim "He who can, does. He who cannot, teaches" to say "He who cannot teach, administers". If such an extension of that dubious proposition is permissible, and certainly I am not suggesting that it is acceptable to me, I suppose I represent this afternoon the worst of all worlds ie. an administrator taking up the teacher's role of lecturer and, still worse, an administrator lecturing to lecturers. None the less I am very glad to join you in these very agreeable surroundings and to begin the concluding session of this week's intensive programme by introducing the discussion on "Polytechnic Administration".

I was gratified to receive the invitation from Coombe Lodge to participate in this conference and it was only belatedly that it occurred to me that the approach did not necessarily represent an expression of confidence by Coombe Lodge in my ability to deal fully and effectively with the topic. Instead it might perhaps be merely an expression of good housekeeping by the Staff College - indeed of economic housekeeping since I happen to be the chief administrative officer of the nearest polytechnic and therefore the cheapest to obtain. I am quite sure that it was not intended to imply that I was a spokesman for my senior administrative colleagues in sister institutions.

When I was first invited to join you, the topic suggested to me was "The Role of the Chief Administrative Officer". At that time the Conference of Polytechnic Secretaries (appropriately referred to by its initials as "COPS") had established a working party on that very topic. You can imagine I was quite glad to accept the invitation on the assumption that the working party would by now have produced a heavy and impressive tome upon which I could base my modest contribution. Unfortunately, I had not anticipated that my colleagues in sister institutions would find it difficult to come to some speedy agreement on what should be said and I confront you without the support of their considered views since the working party has not yet reported. I think I should make it clear, therefore, that I do not speak on behalf of the other polytechnic secretaries. Nor do I speak on behalf of Bristol Polytechnic for that institution, I am quite sure, does not have a corporate view on the subject. Rather, I speak for myself, and will attempt, if necessary, at the end of this session to answer for the views I propose to put.

It may be helpful for me to identify the parameters I have set for myself in this exercise and to define what I understand by "Polytechnic Administration" Certainly there is no university accepted definition. As I have said, the chief administrative officers themselves have encountered some difficulty in coming to agreement and, even within the administration of my own institution, my senior colleagues have differing views. These differences are given still greater emphasis in discussion with academic colleagues. This brought home

very forcibly to me in recent days. At Bristol we are currently involved in elections to the Academic Board and I have been interested to read some of the manifestos submitted by candidates with their reference to the power and independence of action of the 'higher echelon" being strengthened at the expense of academic staff, the unnecessary proliferation of rules and regulations, the remoteness of the "bureaucracy" and so on.

For my own part I would, with certain reservations, accept the concept advanced by Fieldon and Lockwood in their book "Planning and Management in the Universities" of the administration as the civil service of the institution. It seems to me it is the job of the administration to provide and maintain the machinery by means of which the institution determines its policy; to advise and guide on policy; to implement policy once it has been decided; to monitor the outcome and, where necessary, to come forward with suggestions for modification of policy based uponoperational experience. Clearly, in discharging this role, the administration quite properly influences academic policy but I would draw a distinction between that responsibility and the responsibility for initiation and formulation of academic policy which lies with the academic staff of the institution led by the academic management. Here I would draw a distinction between the senior management of the institution and the administration. I am restricting my observations to the role of the administration as the professional "civil service" of the institution.

The chief administrative officer needs to be a member of the corporate senior management team but this is not to deny the distinction I have drawn. It is an essential part of his function to comment and advise on the legal, procedural and resource implications of policy deliberations and sympathetically to present some policy matters to academic board, to governing body and to the local authority. To do so effectively, he needs to be a member of the management team (I shall return to this theme later).

administrative constraints

Having thus defined my topic I might appropriately examine some of the constraints confronting the administration in the discharge of its role:

a) Legislative Constraints

We live in a world of increasing legislative complexity and the polytechnics cannot escape involvement. In recent years successive governments have introduced an increasing programme of legislation dealing with industrial relations and employment illustrated most recently by the Trade Union and Labour Relations Act and the Health and Safety at Work Act. This kind of development has been evidenced in many aspects of polytechnic life. Legislation has been reinforced by statutory instruments and by government circulars to say nothing of local government standing orders and financial rules etc. It is the responsibility of the administration, and of the chief administrative officer in particular, to keep abreast of these developments and to ensure that, what the polytechnic proposes to do, can properly be done and is done properly. In this respect the chief administrative officer is the

senior legal officer of the institution. He does not need to be a lawyer but he does need to be sensitive to the legal implications of polytechnic policy and procedures; to know when legal questions are at issue and to know where and to whom to look for the answers to those questions.

b) Policy Constraints

The legislative constraints imposed upon institutions and their administrators are reinforced by both intra-mural and extra-mural policy constraints. The administration shares the responsibility for ensuring the consistency of policy decisions within the institution whilst having due regard to constraints represented by policy decisions both at local authority and at governmental levels. Since I joined Bristol Polytechnic some 12 months or so ago, we have been much preoccupied with the completion and handover of the first stages in a substantial capital development programmes on a new site a few miles outside the city. This programme has very significant staffing implications, particularly in the area of non-academic staff. In consequence, not only have we had difficulty in establishing and developing mutual understanding between the institution and the local authority but also in reconciling our needs with the advice offered by central government to the local authority on rate fund expenditure. The site is due to become operational in September and we are still engaged in a joint exercise with the Authority in seeking to establish our staffing needs against the background of the Department of the Environment Circular 171/74 which made it clear that the rate support grant settlement for 1975/76 provided for no expansion in present total staff numbers beyond small increases necessary to meet inescapable commitments.

c) Procedural External Constraints

Procedural constraints are imposed by various external agencies and it is the job of the administration to ensure that policy and development are not frustrated by failure to meet these procedural requirements. The constraints I have in mind are illustrated by reference to the need, in pursuing capital building programmes, to take account of the requirements and timetable of the Department of Education and Science. Academic development can be jeopardised by failure properly to observe procedures imposed by regional councils, CNAA and other external bodies.

d) Instrument and Articles of Government

The instrument and articles of government of the institution identifying, in broad terms, the relationship between the local authority and the polytechnic. They identify the membership and terms of reference of the governing body, of the academic board and of some of their subordinate committees. They deal with matters relating to finance; contracts; the appointment, dismissal and suspension of staff; premises; the admission, welfare and suspension or dismissal of students; representation of students and so on. In the context of this submission, it is worth noting that, under the articles of most polytechnics the chief administrative officer is designated both a member of and secretary to the academic board and clerk to the Governing Body. The role of the chief administrative officer as clerk toGovernors is potentially a significant one and I shall return to it later when dealing in more detail with the functions of the administration.

e) Financial Constraints

Clearly one of the most substantial constraints confronting any institution and its administration is the financial one. I shall make later reference to this. Suffice it for the moment to say that it is clear from recent press reports of pronouncements by senior government ministers that this inhibition will represent a growing one at least in the next few years.

f) Structural Constraints

The modus operandi of the administration must take account of the academic structure of the institution. The range of structural alternatives represented across the spectrum of the 30 polytechnics is a rich one. It encompasses at one extreme a hierarchical structure based on faculties with a sub-structure of departments and schools with, at the other extreme, the development of matrix structures, involving the dissolution, or least relegation, of departments and faculties. Between those extremes lies a rich pattern of variety much of which is evident in the institutions represented here today. Clearly all this has implications for the structures and procedures adopted in the administration - again a topic I shall return to later.

g) Human Constraints

The final constraint to which I wish to make reference is the human one. Most polytechnics were created by the amalgamation of two or more smaller colleges from whom they inherited both academic and non-academic staff. Many of those inherited staff are still in post and I would want here to pay tribute to the loyalty and commitment shown by many of those staff in the difficult developmental years which have followed. Much of the progress which has been made on the administrative front can be attributed to the effective contribution made by there inherited administrative staff. At the same time, it has to be acknowledged that in many cases the staff concerned are involved in roles very different and very much more demanding than those for which they were originally appointed - a factor carrying substantial implications for the management of the administration.

functions of the administration

I referred earlier to the rich variety of academic structure across the 30 or so polytechnics. The variety of administrative structures is hardly less diverse. Consequently there can be no dogma about the ideal administrative structure and I shall turn in a moment to structural considerations but first it might be helpful to identify, in broad terms, the functions of the administration as I see them:-

a) Secretariat

I have already mentioned the roles of the chief administrative officer as secretary to the academic board and clerk to the governing body. In discharging those roles he has a responsibility for the effective and well ordered discharge of committee work across the polytechnic. I believe that, as the institutions establish and develop their autonomy, this aspect of his responsibility will grow in significance. In this work he is supported and represented by colleagues at a number of levels of the administrative structure. I stressed earlier the significance of the role of the chief administrative officer as clerk to the governing body. At Bristol, both the polytechnic and the Avon Authority have recognised the distinctive features of that role. Undeniably, in the

day to day discharge of his responsibilities, the chief administrative officer is answerable to the director. At the same time, as clerk to the governing body he is responsible to the governing body and it is important that this distinction should be recognised. On a number of occasions in my year of office at Bristol, I have been involved in representing to committees and to senior officials of the authority the views of the governing body and in protecting the rights and responsibilities of the governing body under the articles of government. That I have been able to do so, on occasions, to some effect can be attributed in no small measure to the fact that both the authority and the polytechnic have quite properly recognised that, on these occasions, I have been acting as an officer of the governors as distinct from an officer of the polytechnic. It may even be that in discharging this responsibility, the chief administrative officer may on occasions be tendering to his governing body advice or opinion in conflict with that of his director. Obviously any prudent chief administrative officer will seek to air any differences he may have with his director in a less public forum but it should be recognised that such occasion can arise and can indeed properly arise. Under this heading of "secretariat" I would also include the responsibility of the administration, and in particular of the chief administrative officer, for the conduct of polytechnic elections to governing body, to academic board and to their respective committees. I would here also attach responsibility for legal affairs and communications. Many polytechnics operate on a multi-site basis and effective communications assume a special significance. The administration is responsible for the establishment and maintenance of both telephone and internal messenger services, for communications between committees, and for the publication of news bulletins etc. External public relations is a developing feature of this work and many institutions now enjoy the support of a professional public relations officer.

b) Academic Administration

Under this heading I would include responsibility for admissions, registration, student records, grants and awards, examinations, scholarships and prizes, ceremonials and so on. In many institutions at least some of this responsibility is discharged by academic colleagues and it is certainly in this area that there is the greatest interaction between administrators and both students and academic staff. For this reason, registry staff need to develop a special sensitivity to academic considerations and to establish their acceptability and credibility to both students and academics. Consequently it is entirely appropriate that polytechnics should increasingly be recruiting graduates to the registry staff - although, I must say, Houghton has done nothing to help in establishing the status of administrators vis-a-vis their academic colleagues.

c) Personnel Work

I referred earlier to the increasing volume of legislation confronting the administrator and in particular the recent employment act. This has followed hard on earlier industrial relations legislation and other legislation relating to employment including for example the officers, shops and railway premises act. The responsibility for satisfying the requirements of this legislation lies with the personnel section which is also responsible for establishment control, staff recruitment (both academic and non-academic

staff), negotiations with unions representing the non-teaching staff, contracts for employment and so on.

The programme of development for academic staff is properly the function of academics but the induction and development programmes for non-teaching staff lies primarily with the personnel section. I believe this to be the area in which there is the greatest need and potential for development - I shall return to this later.

d) Financial Administration

This section is concerned with the preparation of annual budgets; financial accounting; control of commitments; audit; (in some cases) calculation and payment of salaries; payment of accounts and collection of fees etc. Whilst these represent essential features of the administration's responsibility for financial matters, I believe that in the financial climate in which we shall have to operate in the next few years there will be an increasing need to develop the role of the management accountant in polytechnics. Unpalatable as it may be, it will be increasingly necessary, in considering questions relating to the allocation of scarce resources, for institutions to have regard to staff/student ratios, unit costs, comparative costing of services, marginal costing and all the other techniques of the management accountant. We shall be able to establish the credibility of our demands upon our parent authorities only if we are able to support them in this way. Furthermore, I believe that in the next few years institutions will need to be somewhat more discriminating in their allocation of resources when determining their own priority programmes.

e) Administration of Building and Premises

Here the situation in many polytechnics is marked differently from that which obtained in the constituent colleges. Before I came to Bristol, I was at Manchester where the polytechnic had appointed its own architect and was involved in a very detailed way in the planning and execution of major building projects. This is not the case in all polytechnics but, in many, the institutions are substantially involved in building programmes. Recently there has been a slowing down in this area by central government but the role is still an important one. Many polytechnics have appointed their own professionally qualified officers responsible for both major and minor building work; for the maintenance of buildings and of grounds; for portering, caretaking and cleaning services; and for fire regulations and safety measures in relation to premises.

f) Administration of Communal Services

The final section of administrative responsibility to which I propose to refer this afternoon is that relating to communal services and here I would include the catering service, management of student residences and other residential units, reprographic services and so on. These services are organised in a variety of ways in the various polytechnics but, however they are organised, they have to be provided. In some cases, these services are taken outside the orbit of the administration, for example, student residences are part of the student services section which has an academic orientation. I believe this kind of arrangement to be quite valid but in my experience there is

advantage in ensuring that the administration and management of these services is part of the administrative responsibility for which the chief administrative officer must, in the ultimate, answer.

I do not claim this to be an exhaustive statement of the administrative function. I have, for example, made no reference to transport services, to pooled typing services, to questions of safety arising from the recent Health and Safety at Work Act, or to the supply of furnishings and equipment. At the same time I hope that the survey is complete enough for me now to turn to the question of structure.

structure of the administration

I have already said that there is no blue-print for the structure of the administration. In each institution the administrative framework will be determined by reference to a variety of factors:-

a) Academic Structure

The administration exists to service the teaching and research roles of the institution. Clearly, therefore, the structure of the administration has to reflect the academic structure devised to discharge those roles. Some polytechnics have evolved quite substantial senior management teams comprising the director, the deputy director, assistant directors and full time deans (and as I have already said also including the chief administrative officer) - others have less substantial "directorates". Some have developed structures based on faculties with sub-structures of departments and schools; others have made their basic unit the department; whilst others have introduced matrix organisations. Obviously the administrative structure will be determined in part by the academic structure of the institution concerned.

b) Site Considerations

Many polytechnics operate on a multi-site basis. In some cases the sites can be reconciled with departmental and faculty structure, in others not. In Bristol, we are currently involved in a review of our academic structure - an exercise not unknown in other establishments. I cannot anticipate yet what the outcome will be. There is, however, a body of opinion supporting the retention of departments (equally there are bodies of opposing opinion). If the departmental structure is retained it is unlikely to lie neatly in parallel withour site deployment. This being the case, there is in my view a powerful argument for the development of site administrations as opposed to faculty administrations. Since in other institutions different circumstances may obtain, different conclusions may be drawn.

c) Staffing Considerations

I had regard earlier to constraints imposed by staffing considerations. These are given a special emphasis in considering the administrative structure. It is necessary to have regard to the strengths and weaknesses both of those staff inherited from constituent institutions and of those staff appointed to the polytechnic. We need as far as possible, to exploit the strengths and mitigate the weaknesses. We need too to consider the erection of an appropriate career structure in order to ensure, particularly for the new entrant, appropriate prospect of career progression. I sketched a moment ago the main functions of the administration and did so by reference to administrative sections. The danger inherent in such an arrangement is, of course, that it makes more

difficult transferability of staff from one section to another. Where a particular professional expertise is essential to a post it is difficult to avoid some rigidity but, as far as possible, the administrative structure should permit the transferability of the general administrator.

essentials of the effective administration

I should like to conclude my submission by making brief reference to one or two factors which seem to me essential to the effective administration:-

a) Professionalism

I began my remarks by referring to the administration as the professional civil service of the institution. The word "professional" is very important. I think it not unfair to say that very often, before polytechnics were established, the status of college administrators left a great deal to be desired. In some cases the administration was in the hands of those ill-equipped and ill-qualified to discharge their responsibilities. Often a great deal of the administration lay in the hands of academics who, understandably, saw responsibility as an irksome irrelevance to their teaching commitments. Most of my academic colleagues would acknowledge that they are equipped neither by experience nor by training to undertake this work. I believe that we have already established, and indeed, in part, met, the need for a professional administration. As polytechnics progress towards greater autonomy in their relationships with their parent authorities, and as we move towards self-validation in academic affairs, the demands on the administration will continue to grow. If those demands are to be met, and to be effectively met, the administration will need to demonstrate a high degree of professional competence. Indeed, progression towards autonomy will be accelerated by the demonstration of professional administrative credibility both within the institution and externally.

b) Staff Development

Because of the importance of professionalism in administrative affairs I make no apology for returning at this juncture to the need for the appropriate staff development programmes for non-teaching staff. As future financial constraints bear in upon us it will be necessary to relieve academic staff of those functions peripheral to their teaching and research roles. This will mean the assumption of extended responsibility by technical and administrative staffs. Against that background I believe it essential that we develop, for the non-academic staff, programmes of induction and staff development and that those programmes be geared to the career structures to which I made reference earlier.

c) Effective Relationships with Academic Staff and Students

I was glad to come today because of the opportunity afforded me to put the administrator's case to academic colleagues and to refute the view sometimes voiced that the administration represents another unnecessary obstacle between the academic and the realisation of his objectives. The well-being of all our institutions depends upon effective working relationships and mutual understanding between colleagues whatever their roles. I acknowledge that this involves a shift of attitude in some administrators. It requires a new approach from some academics. I hope I may have made some modest contribution today and that we might reinforce that progress in the session which is to follow.

d) Flexibility

Finally, I would submit the need for flexibility in the administration. Polytechnics have been in existence for a relatively short time but few of them have escaped structural reviews, indeed in some there have been a whole series of such reviews. In recent times, the problem has been given new emphasis by the merger of polytechnics with colleges of education. Building programmes are coming to fruition and are involving the phased occupation of new buildings. All these considerations demand a high degree of flexibility in structures adopted by the administration. In matters relating to administrative structures there is particular relevance in the old proverb "Nothing is certain - but uncertainty"."

S J Harris,
Finance Officer,
Polytechnic of
North London.

POLYTECHNIC COSTING - SOME PROBLEMS

1. What costs will a Polytechnic incur if its plans are carried out?

This question can be considered from a number of points of view.

(i) The Polytechnic itself directly uses resources which the community provides directly for it - for example:

Teaching Staff
Support Staff
Accommodation
Equipment
Consumable materials

(ii) The Polytechnic itself incurs social costs indirectly in carrying out its activities - for example:

traffic and communications problems in its immediate area.

possibly pollution through waste products and noise.

(iii) The students attending the Polytechnic are paid grants from public funds.

(iv) The students attending the Polytechnic incur social costs - for example:

attend Polytechnics sited in areas of housing shortage and so make local housing problems worse.

We can in this session only deal with the first of these types of cost - but the others should perhaps be considered at some stage in Polytechnic planning and development.

2. How can directly used resources be measured in terms of cost?

My own Polytechnic has prepared a series of departmental unit costs and the Polytechnic Finance Officers Group have prepared comparisons of unit costs between Polytechnics on behalf of the Committee of Polytechnic Directors. (see Tables 1 and 2).

The major problems here are:

(i) Apportionment of cost when one resource is used for a number of purposes - for example:

Is a Head of Department's salary a teaching cost or a managerial cost?

Should part of the cost of research assistants be regarded as a teaching cost as they teach for six hours a week - is this one third or one fifth of a weeks work?

(ii) Definitions.

How do different institutions or departments classify various types of cost.

To what extent do differences between authorities or colleges affect total costs, for example - PNL pays its own salaries, therefore about £9,000 is paid each year on administrative salaries which would be an expense incurred outside the college in other institutions and either not included or regarded as a recharged central Local Authority cost.

How is capital expenditure included?

(iii) Unit of output.

Should costs be expressed as cost per full time equivalent student or on some other basis?

What is the full time equivalent of a part time student?

Are all full time students to be given the same weighting?

Is it the cost of the course that is more important than the cost of the student? i.e.

Will total costs change if we enrol more students into existing teaching groups or if we increase the number of teaching groups in which existing students are taught?

(iv) Timing of expenditure.

Should course development costs be separated from the costs of running existing courses? If so, should they be recovered over the expected future entrants to the course?

What should happen to the costs of developing courses which never run?

To what extent should inflation be taken into account?

Should buildings and equipment be bought or hired?

3. If costs are considered in Polytechnic Planning should benefits be considered as well?

The answers are far more difficult here. In practice we tend, within our Polytechnics to ignore the benefits by concentrating on the courses and their costs, but perhaps we should consider:

(i) Can benefits of different courses be measured?

(ii) Can the benefits be balanced against the costs?

4. Should we consider costs (in terms of resources) when planning within our Polytechnics?

The problems here are:

(i) Who should consider costs:

The course planning team?
The college administration?
The Directorate?
The Academic Board?
The Local Education Authority?
The DES?

(ii) When should costs be considered?

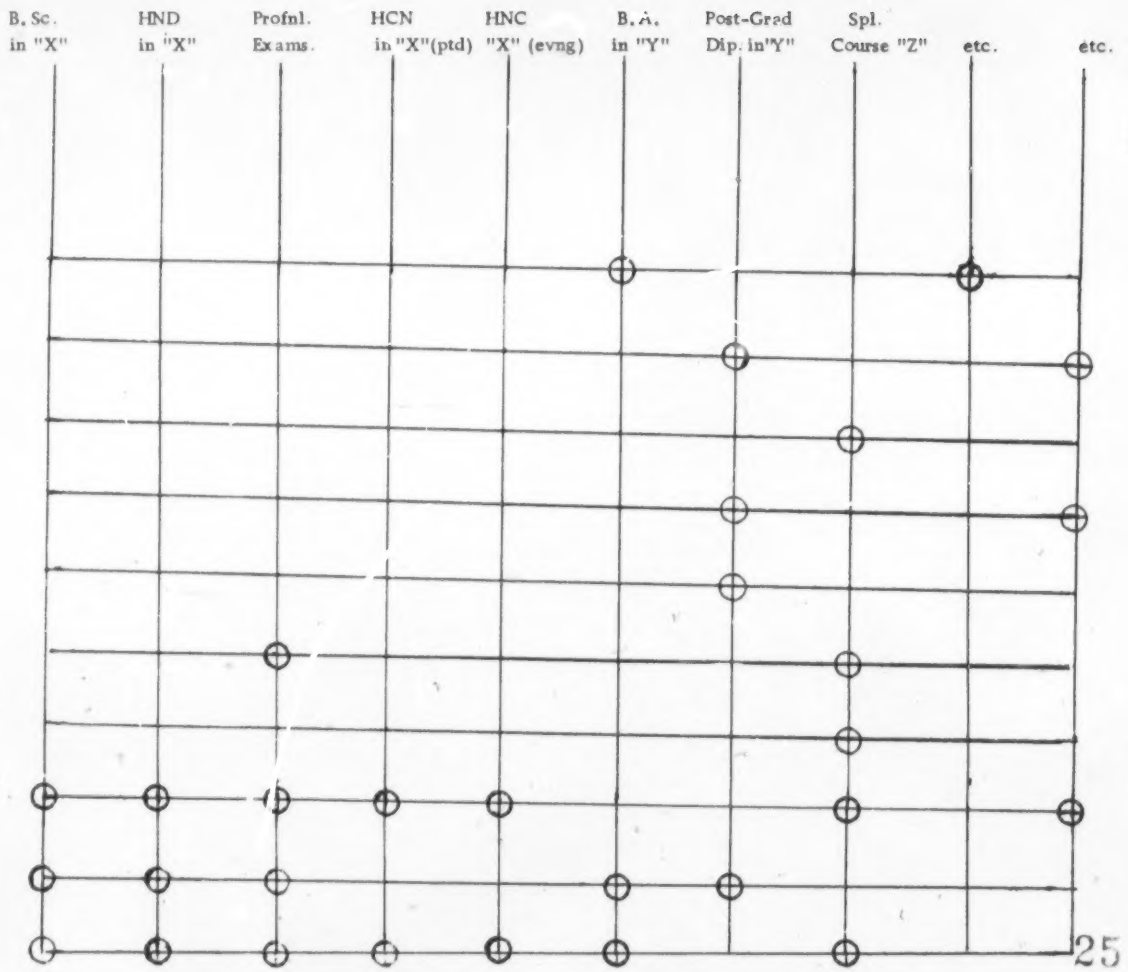
When the course is first mooted?
While the course is being planned?
When the academic content, etc., of the course is ready for approval?
When the course is in operation?

(iii) To what extent should costs be considered?

Diagram 1 - A TYPICAL MATRIX STRUCTURE

COURSES

i.e. the organisation of courses and supervision of students in:-



RESOURCES
ie. staff, special accommodation and equipment for:-

ACCOUNTANCY

ARCHITECTURE

BIOLOGY

BUILDING ECONOMICS

BUILDING ADMINISTRATION

CHEMISTRY

CHEMICAL ENGINEERING

COMPUTING

ECONOMICS

MATHEMATICS

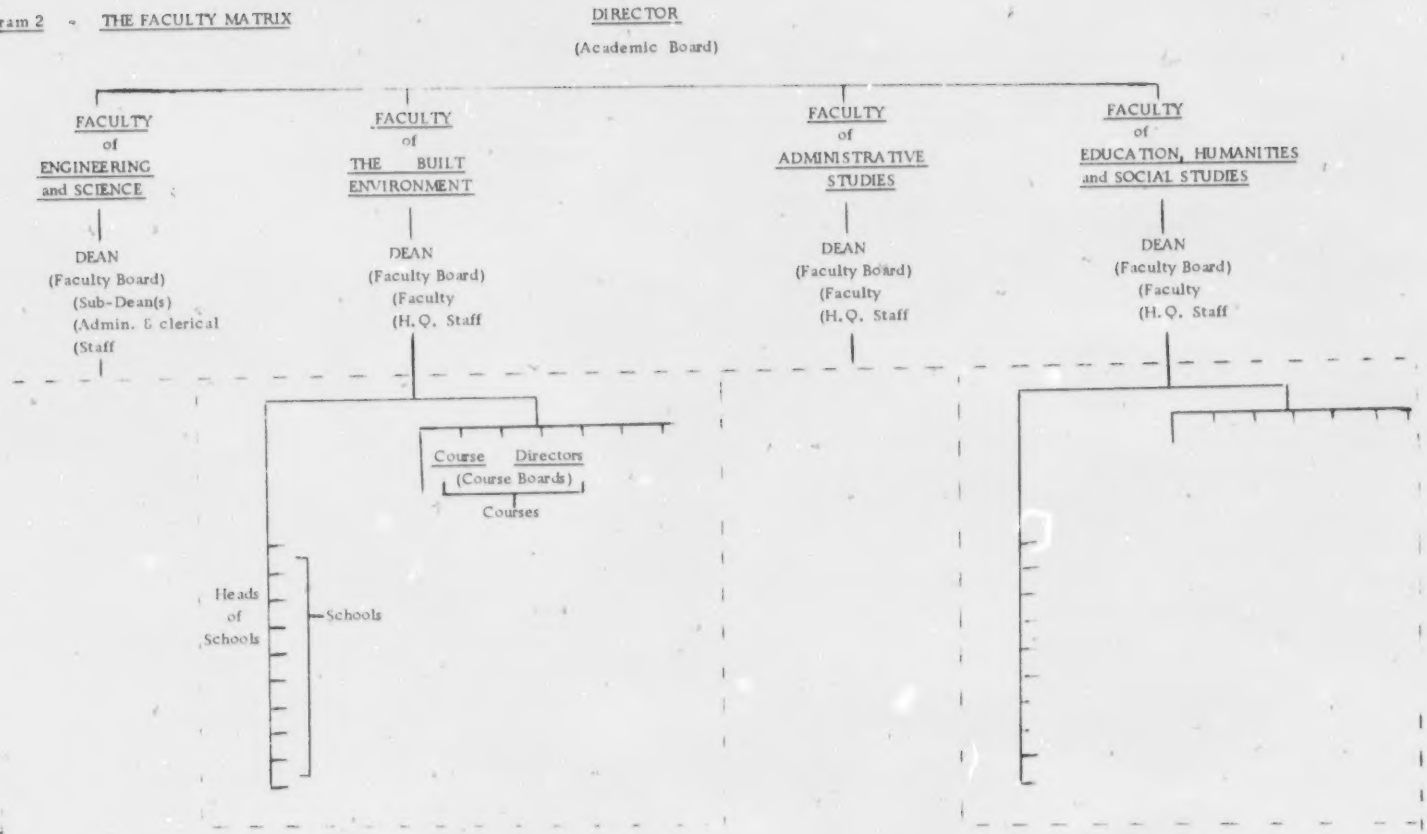
ETC

615

24

25

Diagram 2 - THE FACULTY MATRIX



V Pereira Mendoza,
Director,
Polytechnic of the South Bank.

A CRITICAL APPRAISAL OF SYSTEMS OF ORGANISATION IN POLYTECHNICS

"Nearly a decade has elapsed since the White Paper of 1966 first introduced the concept of Polytechnics, as we now know them; the first Polytechnics were designated some eight years ago. It would not be unreasonable to expect that, by now, most Polytechnics had acquired a sufficient understanding of their purpose and objectives to have developed a common pattern of organisation and one that had proved, by trial and error, to suit their needs best.

the continuing debate

I venture to doubt whether this is so. I would wager few polytechnics, if any, would claim to be wholly satisfied with its academic organisation and quite a number would admit still to be in the throes of trying to effect improvements, as indeed we still are in my own Polytechnic. The numerous discussions that have taken place here, at Coombe Lodge, going back to 1970 if not earlier, on the optimum form of an academic structure for a Polytechnic, lend emphasis to the problems we have all encountered and most of us still encounter in establishing the form of organisation best suited to our needs and circumstances.

We need not be ashamed to be still struggling with this problem. It is one that also besets many Universities, despite their longer traditions. It is a problem that arises as much from the changing pattern of courses in Polytechnics and the growth of new academic disciplines as it does from our relative inexperience as large and diverse institutions of higher education.

I therefore make no apology for putting forward some thoughts on systems of academic organisation in Polytechnics since I believe this to be a subject that will long be a live issue for most - if not all of us. It seems to be vitally necessary to compare notes from time to time to try to benefit from each others' experience of various systems of organisation. At the very least, some of us will thus be warned of pitfalls that others have encountered. Here, in the Further Education Staff College, we surely have the right forum for the exchange of ideas on a matter of such general concern.

I think there are two questions we should ask ourselves before we can embark on a comparative appraisal of various forms of academic organisation. They are:-

(i) Do we need a formal organisation at all?

(ii) If we do, what objectives does it seek to serve?

The first question is rarely asked, perhaps because the answer is self-evident. I am prompted to ask it because of a remarkable piece of grafitti I recently saw in the London Underground. It read, "Anarchy is Order". Whatever may be the political motivations of that particular message, I don't think any of us would subscribe to the view that a Polytechnic could run successfully without being structured in some way. Indeed, if there were no formal structure, informal structures would be developed by the stronger personalities - probably in a variety of modes. At its most pragmatic level, the need to grade staff in a Burnham pattern requires a structure to define levels of responsibility.

main objectives of the structure

So a structure of some sort we must have. But what should be its purpose? It does not suffice to answer by saying it should facilitate the most effective or efficient achievement of the Polytechnic's educational objectives because these are themselves varied and variously interpreted. There are also other considerations that weigh with staff and students - consciously or subconsciously - in preferring one structure to another.

In my own Polytechnic - South Bank - we have been debating academic structures hotly for over three years (and, incidentally, have yet to implement our latest proposals - but more of that anon). Over this period, I have read over a hundred submissions from members of staff and from students giving evidence to a Committee on Academic Structure and I have listened to many views expressed at staff meetings on the subject. These views were confusing in their diversity and disturbing in the variety of assumptions on which they were based. There certainly seemed to be no general agreement on the basic objectives to be achieved.

Of course, this is not a question of absolute truth but rather one of relative priorities. There are some who would place, as first priority, the cost effectiveness of the organisation. There are others who would rank first the career opportunities offered to staff. Yet others preferred an organisation that gave the greatest weight to subject development and research. But none of these criteria, important though they all are, was the one that was ultimately recommended and accepted as being the first priority. This was seen to be the best interests of the students following courses in the Polytechnic. This was put at a higher priority than all other considerations - higher than staff interests, higher than administrative convenience or financial economy and higher even than the achievement of excellence in one or more academic subjects or research activities.

This is not to say that other objectives are unimportant - indeed, they are all inter-related. But the view that I am advancing and one that has been

generally accepted in my Polytechnic is that pre-eminence must be given to the effective teaching and the personal development of the students.

Having decided that, there is still ample scope for arguing which form of academic structure does best meet this primary objective without seriously prejudicing the many other desiderata. I am sure I do not need to say that we have argued often and vigorously, and that the argument still persists to some extent.

What I hope to do in this paper is to look at some possible forms of academic structure in the light of the various objectives and try to assess their relative merits. I shall, of course, finally throw my weight behind one particular structure but I shall not fail to point out the snags that we have found in trying to implement even this one of our own choice.

terminology

Before I embark on my detailed analysis, may I say a word about terminology. In discussing academic structures, words like "Faculty", "Department", "School", "Division", "Section" and so on tend to be used. More often than not, the user blandly assumes that his listeners or readers ascribe the same meaning to these words as he does. Nothing could be farther from the truth. It is not uncommon for the same term to be used in completely different senses by two people arguing the respective merits of their respective systems. I shall try to remember to define my terms as I go along and I plead with you to do the same in the ensuing discussion.

types of department

In the good old days, when life in a Technical College (or, if one were high-class, in a College of Technology) was simple and everyone knew his place, we had "Departments". A "Department" was a Department was a Department - and to judge by even the latest Burnham Report, it still is. Thus a Department of Mechanical Engineering was staffed by Mechanical Engineers and offered courses in Mechanical Engineering. The Department of Chemistry consisted solely of chemists and taught courses in Chemistry. What could be simpler or more logical or more right? It stood the test of decades without coming unstuck.

True, there were awkward little anomalies such as who should teach Mathematics to Mechanical Engineers or who should teach Physics to Electrical Engineers. True, some departments were formed solely to perform these functions known as service teaching. It became a little more complicated when the Mathematics and Physics Departments aspired to run courses in their own subjects and we then arrived at the situation when most departments both ran "their own" courses and "serviced" courses in other departments.

But the complications do not end here. "Liberal Studies" reared its head, to become, in due course, "Complementary Studies", "Contrasting Studies" or "what have you", and a variety of arrangements were adopted to absorb

this strange animal into the hitherto neat structure of a Technical College. But just as the Mathematicians and the Physicists had aspired to and obtained first, their own departments and then, their own courses, so did the small group of staff teaching "Liberal Studies". In the case of one College - and I don't suppose it is unique in this respect - a "Division" (i.e. an embryo department) of Liberal Studies ultimately grew into a Department of Humanities and Social Studies, with a very large degree course in Sociology and courses in Education, Social Work, Health Visiting and much else. "A department is a department is a department."

Meanwhile, the Mechanical Engineers, now, of course, embracing Production or Industrial Engineering, develop courses in Work Study, Ergonomics and Industrial Management and add to themselves Industrial Psychologists and Physiologists. (I have even heard of one Polytechnic where courses in nursing started in the Department of Mechanical Engineering!)

But the fun really starts when a department is formed to meet the needs of a defined profession, such as Estate Management (which needs, for its courses, Valuers, Land Surveyors, Economists, Lawyers, Social Scientists and Quantitative Analysts) or to provide inter-disciplinary courses such as Environmental Engineering or Business Studies. The ultimate is the deliberately planned, broadly based, multi-disciplinary course which, in the end, demands either a multi-disciplinary department or an enormous quantity of service work.

The significance of the department now defies all definition.

It was considerations such as these that set so many of us into an examination of our academic structures in an attempt to define what a "department" really was or what we wanted it to be or whether we wanted it at all.

Let us look, first of all, at one or two possible definitions of a department. The concept of a department in a college is a unit of sub-division in a radial or military form of organisation, that is to say, the whole work of the college and the whole of its teaching staff is sub-divided into such units, each being distinct from the others. Very often, in larger colleges and Polytechnics, the departments are grouped into Faculties. Very often too, departments are further sub-divided but the nature of the sub-departments will depend on the nature of the departments themselves.

Let us start by considering a simple concept - a department in which all the members of staff are qualified in and teach a single academic discipline. To keep it simple, let us take a Department of Physics staffed only by Physicists. They teach Physics on courses in Physics (if any) and on any other course in the Polytechnic in which Physics teaching is required. If they run courses in Physics, they rely on service teaching from other

departments to teach the other subjects in the course, e.g. Mathematics. I call such a department a "Subject-based Department."

Let us take another example - say a department of Business Studies set up specifically to provide courses in Business Studies. It might be staffed by Economists, Mathematicians, Accountants, Lawyers, Sociologists and Psychologists. They all teach on the various Business Studies courses in the department and possibly do little, if any teaching outside the department. The department does not depend (other than marginally) on service teaching from outside itself. I call such a department a "Course-based Department."

What are the relative merits of these two kinds of department?

Let us first look at the "Subject-based Department".

The close grouping of members of staff subscribing to a common academic discipline leads to fruitful development of the subject concerned, both in its teaching and in its research. Moreover, such a group of staff tends to become increasingly expert or highly qualified because it continues to attract to itself new members who find it congenial and rewarding to work with their professional or academic colleagues in a fully collaborative way. It is through a subject-based department of this type that the development of academic excellence in the subject concerned is fostered.

A subject-based department most easily finds its counterpart in other academic or research organisations and its nature is readily identified by external bodies wishing to make academic contact. It is thus an effective medium for external academic contact for purposes of research or consultancy.

The head of a subject-based department should be well qualified academically and professionally in the same discipline as the members of his staff. He is thus able to be the academic leader of his department as well as its administrator and is able to stimulate interest in research and the development of teaching methods in the subject concerned.

The career structure and prospects of members of staff are readily apparent within a subject-based department since the head himself is familiar with both the abilities of the staff and the promotion possibilities within the department.

The advantages - indeed, the necessity - of a subject-based department are most apparent for an academic discipline that is largely dependent on laboratories or other highly specialised accommodation or equipment. The organisation and economic use of such resources, including the deployment of technical and research staff, is a strongly unifying activity for all members of staff subscribing to the discipline concerned. If not grouped within a single department, wasteful duplication of expensive resources may

be the only alternative. The staff teaching such a laboratory-based subject cannot work or be organised adequately within a department that is not also responsible for the physical resources.

On the other hand, the subject-based department, as the basic department of an academic structure, has a number of disadvantages. Of these, probably the most prominent is that of "service" teaching.

I have met a wide range of views about the quality of inter-departmental service teaching and one's view of it is largely coloured by the experience one has had. On the one hand, it can prove not only satisfactory for the course concerned but a useful means of establishing contact between the staff of the two departments involved. At the other extreme, it can be done very badly with little regard for the needs of the course. It is not unknown for departments to deploy their weakest staff on service work and to retain their best to teach on their own courses. Whilst such a situation can be avoided and is not inherent in a structure consisting of subject-based departments, such a structure maximises the extent of service teaching and thus is most exposed to this danger.

Subject-based departments are sometimes criticised for their lack of emphasis on the student and his course. Even where a course is strongly biased towards a single subject area, it is not unusual for that subject to feature only in a minor way in the earlier years of the course and for the student to find it difficult to identify himself with his parent department. This difficulty is greatly magnified for courses spanning a variety of conventional disciplines. There is an increasing tendency to develop such multi-disciplinary courses and both their planning and their administration do not easily combine with a subject-based academic structure. Indeed, it has been strongly represented that a subject-based structure inhibits the desirable growth of inter-disciplinary courses and engenders a myopic outlook in staff and students.

Let us now turn to the Course-based department.

Members of staff comprising a course-based department are qualified in one or more of the subjects taught to students on the courses concerned. They are responsible for evaluating the needs of industry, commerce or society in relation to these courses, for designing the courses, recruiting and selecting students, lecturing on the course, tutoring and examining the students, organising and supervising industrial and commercial training and all other functions in connection with the courses concerned and the students enrolled on them.

Such a structure provides the optimum organisation for the planning and operation of courses and is closely identified, at all stages, with the students following the courses and with their subsequent careers. It emphasises the relevance and subservience of all individual academic subjects to the course

and to the needs of the student and it maximises the integration of the parts of the course into a harmonious whole.

The perfect course-based department entirely eliminates the need for service teaching and provides the optimum conditions to ensure that the most appropriate lecturer teaches each subject in the most appropriate way. Since all staff members of such a department are wholly and exclusively committed to its courses, no "second-best" treatment is given even to minority subjects.

A department of this type is as much applicable to a multi-disciplinary course as to one in which a single academic discipline predominates. In either case, students can readily identify themselves with their parent department which not only interviewed and enrolled them but is also responsible for teaching and assessing them at all stages of the course.

Course-based departments do not always suit those members of staff who subscribe to one of the minor disciplines in the department. Although, in their teaching activities, they identify themselves with the department's courses, they are denied, within their department, full academic and professional development in their own subject. This could well cause some frustration and impair the quality of their teaching.

Whilst the course-based department minimises the need for service work, it cannot completely eliminate it since the demand for the teaching of some subjects might amount to less than would justify a full-time appointment or any greater integral number of appointments. The small amount of residual service work would not, however, be great enough to let its control pass out of the hands of the course department and the familiar evils of servicing could easily be avoided.

As regards research, a multi-disciplinary department can provide an excellent environment for the development of collaborative research at the interfaces of conventional subjects. The opportunities for productive research need be no less than in the subject-based department.

There is, however, a danger inherent in the course-based arrangement which is not encountered in the subject-based department. This is the possibility of appointing inappropriate staff to teach minority subjects, since there might be no other expert in the department in the subject concerned who is able adequately to judge applicants. A similar danger is the possible failure to recognise the need to make a specialist appointment in a minority subject and to believe falsely that, with a slight extension of effort, an existing member of staff could undertake the work.

You will probably recognise that many departments in Polytechnics and in other colleges fall into neither of the above two categories completely but are something of a mixture of the two. I call these "traditional departments". As their name implies, they have arisen in most colleges, usually by accident of history, by developments which had not been foreseen when a departmental structure was originally planned, to accommodate such developments, somewhat uncomfortably, until the structure can be suitably modified.

Mixed departments of this type combine some of the advantages and some of the disadvantages of both the pure course-based and the pure subject-based departments, the balance of advantage obviously varying with circumstances. It could, in fact, be said that many of the strains, confusion and ambivalence now being faced by most polytechnics, which have led to reviews of academic structure, largely owe their origin to the untidy, inconsistent and sometimes incomprehensible system of departments that has been inherited from previous colleges.

Thus, in many traditional departments, are found, to various extents, most of the worst features to which attention has already been drawn, such as unsatisfactory service teaching and a myopic outlook. Because such departments tend to become autonomous, they offer a fruitful soil for excessive authoritarianism and for empire building. The latter attitude encourages much wasteful duplication of resources and unnecessary proliferation of courses, for the greater glory (and possibly salary) of the Head concemed.

The traditional or mixed department has certain disadvantages peculiarly its own. Whereas it is simple to identify courses (and, in most cases, cognate groups of courses), and to define many academic disciplines without undue difficulty, the appropriate mixture of these within a traditional department constitutes a never-ending source of contention and friction. The need to fit new developments within one of a range of existing departments, in the face of conflicting claims of both course and subject affiliations, constitutes on a major obstacle to the resolution of academic problems.

A corollary to this is the obstacle offered by a mixed department to the encouragement of new growth as a separate entity. Such a proposal may be opposed on the grounds that strong subject ties bind it to the original department. The development of new subjects required by the new course also tends to become the prerogative of the same department. The traditional department thus has no logical limits to its possible growth if allowed to develop both courses and subject expertise without external constraint.

Nevertheless, it should be recognised that the traditional department has worked reasonably well in the past and continues to do so in many departments of many polytechnics. It is mainly when considering provision for future developments, and particularly those of a multi-disciplinary nature, that its weaknesses become most apparent.

If, then, subject-based, course-based and "traditional" departments all have their drawbacks, what other forms of structure remain to be explored?

matrix structure

One obvious answer - and one which I see is anticipated in the reference to the second of Nelson's articles quoted in your bibliography* - is the matrix structure, that is a structure in which different functions form, so to speak, the warp and the weft of a woven fabric. The two major elements that are thus interwoven usually comprise "courses" in one dimension and "resources" (i.e. staff and physical resources) in the other, the latter being according to academic discipline. Such a structure has often been described here at earlier conferences. Diagram 1 indicates its general form.

I believe The Hatfield Polytechnic was the first to advocate such a structure although it delayed implementing it for some years and eventually did so in a somewhat modified form. Middlesex Polytechnic operates a form of matrix structure and Thames Polytechnic a hybrid between a matrix and a hierarchical departmental structure. There may be others.

I do not propose to discuss a full matrix structure in detail - that has been done before, by others. It is recognised to be a structure that is both flexible and adaptable and one that creates the maximum degree of staff involvement in the organisation of the work of the Polytechnic. It is the form of structure that most readily accommodates multi-disciplinary courses without strain or artificiality. It is also recognised as being a structure bristling with difficulties, not least in the number of possible interfaces or intersections between courses and subjects across the whole Polytechnic.

In a matrix structure, staff "belong" to one element - the "resource" element, as it is termed in one Polytechnic - but teach on courses forming the "course" element of the matrix. They thus have dual loyalties and are subject to simultaneous control from two directions. It would be an understatement to say that this can give rise to difficulties! A matrix structure, embracing the whole Polytechnic, becomes more difficult to operate when, as so often is the case, the Polytechnic is divided between a number of sites.

In an article on Polytechnic Management in the Times Higher Education Supplement Nelson contrasts the flexible, loosely-controlled matrix structure with a more authoritarian structure based on strong faculties - that is, faculties that are really management units and not merely a facade and means of representation in a centrally managed structure.* In my Polytechnic, we did not see any dichotomy between these two concepts but came to the conclusion that a matrix structure could operate within each of a number of

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*Nelson, J. The Matrix Alternative and Inevitability of Change. Second Article on the Problems of Polytechnic Management. Times Higher Education Supplement, 14th February 1975, No.174. page 26.

faculties, with strong faculty management. We saw in such an arrangement a means of avoiding some of the problems of the overall matrix structure.

The structure we are therefore planning to adopt is a faculty-based, faculty-managed matrix structure. Within each faculty (four, in our particular case), courses will be managed by Course Directors who chair the relevant Course Board. The Course Board decides the policy under which the course operates within the overall policies of the Faculty and Academic Boards. Although we have not yet implemented the new structure in full, we have already introduced Course Boards and Course Directors throughout the Polytechnic and find that, by and large, they operate without difficulty.

The Course Director is responsible for everything connected with the course itself and the students enrolled on it, except the actual teaching and the control of physical resources such as laboratories.

Within each Faculty, we propose to group staff according to their major academic discipline, into units we term "Schools". Staff are currently opting for the School of their choice, a list of Schools in each Faculty having been approved by the Academic Board. We allow staff to have a secondary association with another School if they wish although for administrative purposes, they will be assigned to their primary choice. We also propose to allow staff to change their school at the end of a session.

Each School will be controlled by a Head of School (who may be graded Head of Department, Principal Lecturer or occasionally Senior Lecturer). Schools will vary in size from 4 to 5 members to over 20. Some will be virtually identical in membership with existing departments; others will be much smaller. The Schools will control the laboratories, studios, technicians, specialist equipment and other facilities appropriate to their subject. They will also be the centres of research based on that subject. Diagram 2 indicates the general arrangement we have in mind and Diagram 3 to 6 the detail within each faculty.

The Head of School will be the academic leader of his subject. He will be responsible for staff timetables and will assign staff to teach on courses at the request of Course Directors. We recognise that there is a potential source of conflict between Course Directors and Heads of Schools over the issue of who teaches on which course and we believe we have devised procedures to minimise such conflicts and to resolve them when they occur.

The grouping of courses and of Schools within faculties is such that we expect to find that cross-faculty service teaching is reduced to a minimum. Service teaching within the faculty becomes a meaningless term since everything belongs to the faculty, courses are not linked with particular schools and departments will disappear as such.

One obvious question is whether we contemplate the duplication or multiplication of Schools in a given academic discipline where the subject is required by more than one faculty. The answer is "yes", provided that each such School is large enough to be viable (which we reckon to be more than 4 or 5 members). Thus there are to be Schools of Mathematics and of certain of the Behavioural Sciences in three faculties and a School of Law in two.

One of the advantages of this arrangement is that a faculty at a remote location can be virtually self-contained. An obvious disadvantage is that special arrangements have to be made to bring together, for example, the Economists who belong to Schools in two or three different faculties. We have made provision for this.

I have so far said nothing about the faculty itself. We intend to make it a real and powerful unit, with a marked degree of delegated authority from the central administration but also absorbing, within the faculty office, many of the administrative responsibilities at present undertaken by departments. We see the job of Dean of Faculty as a full-time one of major responsibility and regard it as essential that the Dean be backed up by an adequate administrative and clerical staff and be assisted in his responsibilities by one or more academic sub-Deans, who may be occupied only part-time in that capacity. We intend that the Dean be appointed, on a three-year basis, from among the members of the faculty and need not necessarily be of Head of Department grade before being appointed Dean.

With the disappearance of departments as such, the role of a Head of Department becomes difficult to define and we have yet to solve the Burnham implications of this problem. We expect to see various posts graded as Head of Department - the Deans certainly, some Heads of large Schools and some Course Directors of major courses.

It is now well over a year since we decided to adopt such a faculty-based matrix structure in principle and we do not expect to implement it fully until 1976.* In the meantime, we are trying to anticipate all the likely snags and to devise appopriate procedures and arrangements to overcome them.

The biggest problem of all is that the new structure is essentially less efficient in the use of manpower - that is to say less cost-effective - than the traditional hierarchical departmental one. We recognise this fact but believe that the academic advantages accruing from the new structure and, above all, the greater involvement of many members of staff in positions of responsibility, will justify the extra demands this structure will inevitably make on

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*The difficulties involved in implementing the proposed new structure now seem to be proving insuperable and it is doubtful whether the new structure will be adopted in 1976. (Ed.).

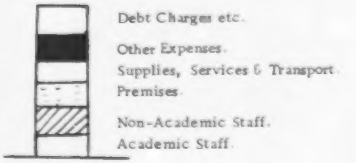
administrative and clerical support.

We could not have taken this decision at a worse time - a time when the likelihood of increasing such support is minimal. Nevertheless, we are now committed to the new structure which we intend to implement, albeit somewhat haltingly, early in 1976. If I am invited to lecture here again later that year or in 1977, I may be able to report on how it is working - or is not working!

Meanwhile, for those of you who would like to study it further, there should be a few copies of our Report on Academic Structure in the library here. I should also be very happy to answer any questions on it."

Table 1 COST OF POLYTECHNICS

Costs per FTE 1973/74 Estimated Expenditure.



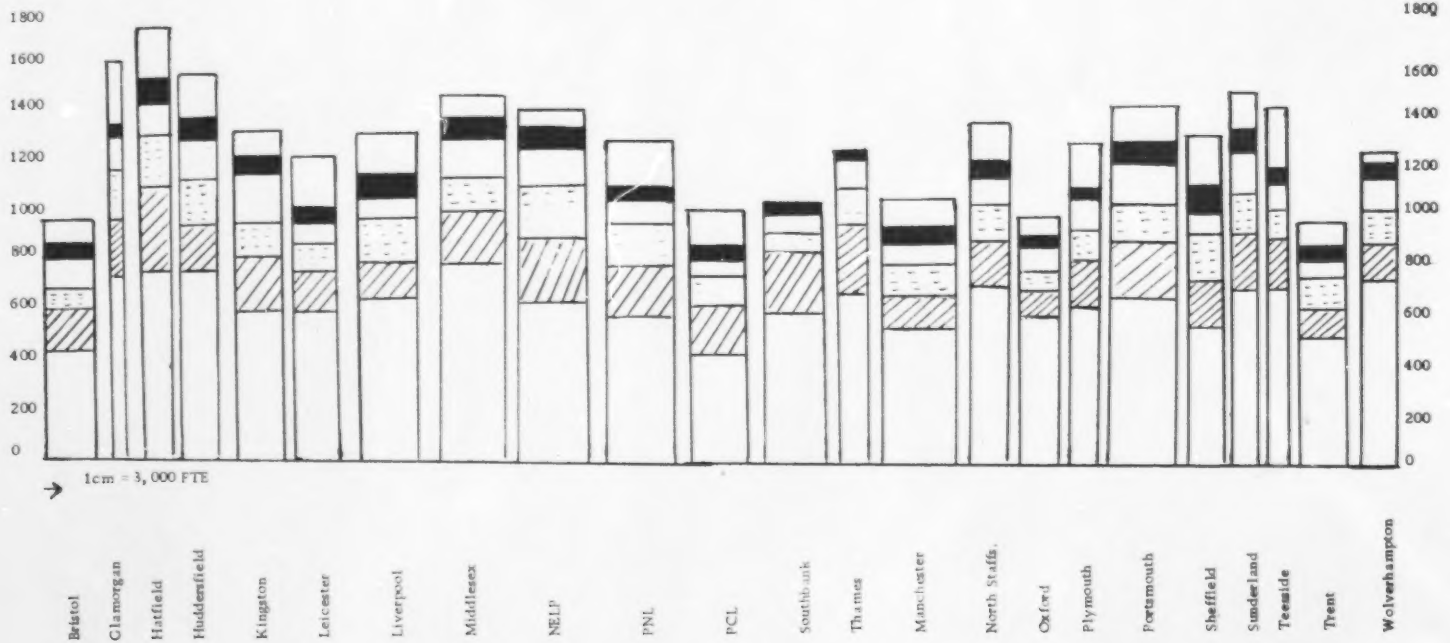


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Table 2 COST OF INDIVIDUAL DEPARTMENTS

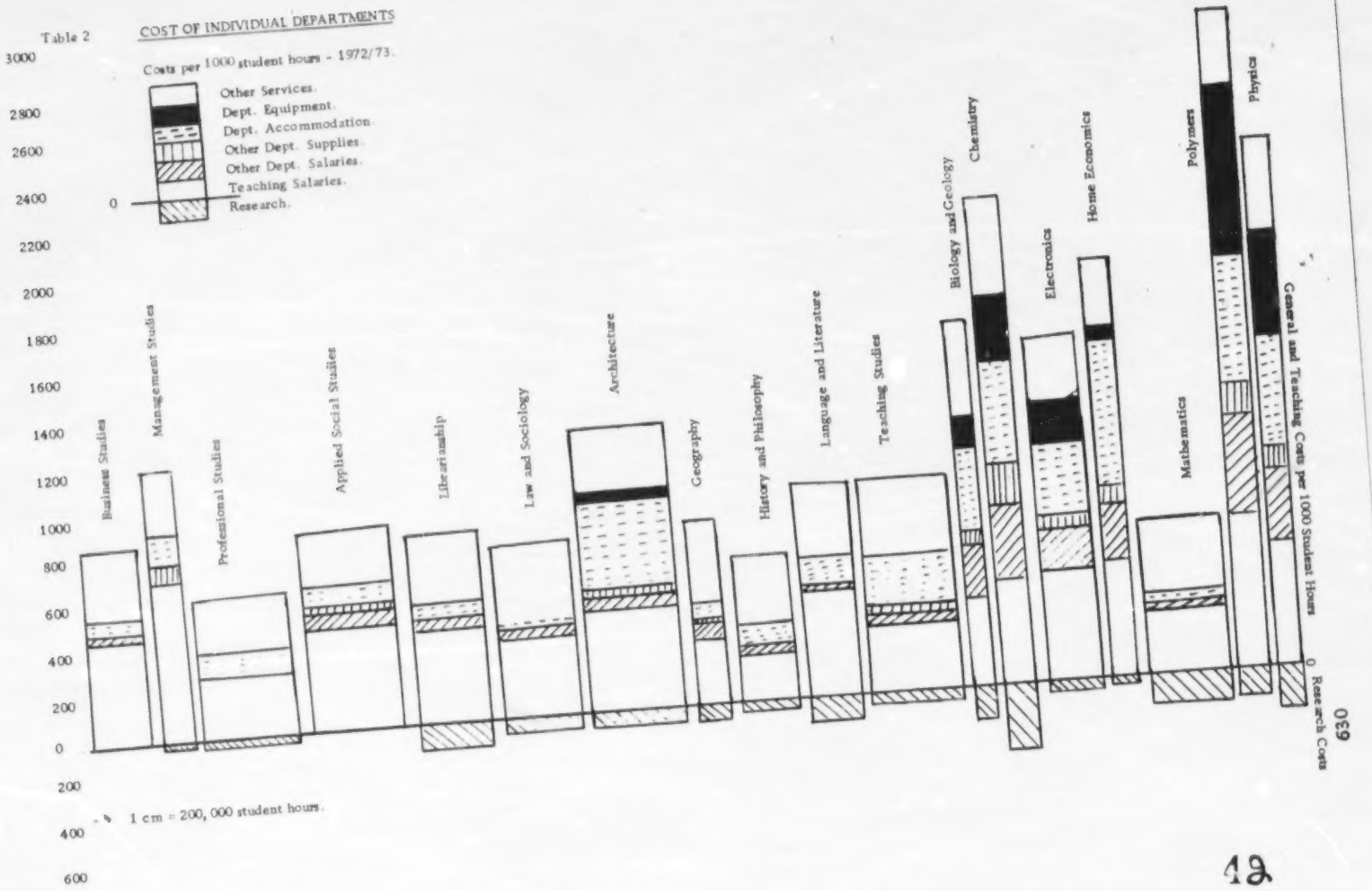

Diagram 3

THE FACULTY OF THE BUILT ENVIRONMENT

Proposed Schools

Architecture
Building
Building Economics
Building Surveying
Civil and Structural Engineering
Construction Science and Materials
Environmental Science and Technology
Estate Management and Valuation
Land Surveying
Law
Lighting and Electrical Services
Management
Mathematics, Statistics and Computing
Social Sciences
Town Planning

Major Courses

CNAA Degrees (BSc)

Architecture
Building
Building Economics
Civil Engineering
Environmental Engineering
Estate Management
Occupational Hygiene
Town Planning

CNAA Post-graduate Diplomas

Environmental Engineering and Design
Property Development Studies

HND's

Building
Civil Engineering

HNC's

Building
Civil Engineering
Estate Management
Surveying
Planning

Polytechnic Qualifications

FT Architecture graduate diploma
Environmental Engineering diploma

PT Surveying graduate diploma
Town Planning graduate and postgraduate diploma

Professional Qualifications

FT Art & Design London Cert.

PT Architecture (ARIBA)
Building (Member Institute)
CEI (Civil Eng. subjects)
Estate Management (ARICS)

Diagram 4 THE FACULTY OF ENGINEERING AND SCIENCE

Proposed Schools

National Bakery School
Biological Sciences
Chemical Engineering
Chemistry
Computing Studies
Electrical and Electronic Engineering
Energy and Natural Resources
Food Science and Technology
Industrial Management
Manufacturing Technology
Mathematics
Mechanical Engineering
Metal and Surface Sciences
Physics
Polymer Science and Technology

Major Courses

	BSc	MSc
FT	Applied Physic	Applied Nuclear Physics
	Chemical Engineering	Polymer Science and Technology
	Chemical and Polymer Technology	Solid State Optics
	Electrical Engineering	
	Food Science	
	Mathematics and Computing	
		BSc (Post HND
PT	Electrical Engineering	Mechanical Engineering
	Mechanical Engineering	Manufacturing Technology
	Physics	

Other CNAA Courses

Mechanical Engineering postgraduate diploma

HND's	HNC's
Applied Biology	Applied Biology
Chemistry	Chemistry
Chemical Engineering	Chemical Engineering
Computer Studies	Computer Studies
Electrical and Electronic Engineering	Electrical and Electronic Engineering
Food Technology	Food Science
Mechanical Engineering	

Other Courses

20 - 30 leading to various Professional or Polytechnic qualifications.

Diagram 5

THE FACULTY OF ADMINISTRATIVE STUDIES

Proposed Schools

Accountancy
Behavioural Sciences
Economics
Finance
Government and Public Administration
Languages
Law
Management
Marketing
Quantitative Analysis

Major Courses

CNAA Degrees

B.A.

FT Business Studies
Law
Modern Languages

HND's

Business Studies
Business Studies (with Languages)

HNC's

Business Studies
Public Administration

Polytechnic Qualifications

FT Hospital Admin (Overseas) Diploma
Secretary Linguists Diploma

PT Hispanic Studies Certificate

Professional Qualifications

FT Accountancy ICA and ACA
YESTB diploma

PT Accountancy various
Cost and Management Accountancy (ICMA)
Health Service Admin (IHSA)
Languages (Subscriber and Institute Linguists)
Marketing (IOM Pt 3)
Management Studies (DMS)
Taxation (Membership Institute)

Diagram 6

THE FACULTY OF EDUCATION, HUMANITIES AND SOCIAL STUDIES

Proposed Schools

Applied Social Studies
Economics
Expressive Arts (Art, Drama and Movement Studies)
Home Economics
Humanities, (English History, Philosophy)
Nursing and Health Studies
Psychology
Sociology
One or more Schools of Education

Major Courses

CNAA Degrees

BSc	MSc
Social Sciences	Sociology
Nursing Studies	

CNAA Postgraduate Diplomas

Health Education
Applied Social Studies

Professional Qualifications

FT	Certificate in Education	Certificate in Education
	Clinical Teaching Cert.	Post-graduate Diploma in Education
	Nurse Tutors Diploma	Nursing Diploma

Awaiting Approval

B.A. Hons. Degree in Combined Studies

B.A. Hons. Degree in Contemporary Studies

B.Ed. - Full-time and Part-time, including various specialisations.

A Walker,
Head of
Department
of Surveying,
Liverpool Polytechnic.

THE RELATIONSHIP OF RESEARCH AND CONSULTANCY TO COURSES AND RESOURCES

"I am going to talk in general terms about research in surveying departments in polytechnics. My paper may appear to have a Quantity Surveying bias, for which I apologise. I will try to stick to general matters.

I will frame my talk around a series of questions which I will put and then attempt to answer - I find that I am better at answering my own questions than other peoples and I do not often get chance to do this!

I must of course, declare my interest at this stage - I believe that research is an essential aspect of our work and I believe it makes a significant contribution to the quality of the courses we offer and the academic environment in which we work. Having said this, it may seem that my questions are rather weighted in one direction. However, here they are:-

1. What is the purpose of research?
2. What should be the nature of our research?
3. Why should we in the Polytechnics do it?
4. What talents do surveyors have for research?
5. What are the problems to be faced?
6. What are the tangible benefits?
7. What about resources?
8. Where does consultancy fit in?

purpose of research

For a start then, what is the purpose of research? I am directing this question at a group of people who should have a common aim in undertaking research, namely the staff of Departments offering surveying degree courses in Polytechnics.

Is its aim to benefit the person doing research?
Is it to benefit the courses?
Is it to benefit the students?
Is it to benefit the profession and associated industries?
Is it to benefit society?

It is I suppose all these things to varying degrees, one tends to follow on from the other but in our particular colleges which if any should predominate? I am sure that we all believe that polytechnics are primarily teaching institutions and because of this research must have the aim of benefitting teaching above all, but in benefitting teaching other benefits will accrue. Research if it is of any value, must improve the thought processes of the researcher if the research contribution is going to pass from him to his students. Once this situation is set up the channels are open for research to feed into the professions through the student and through the researcher, and one would hope ultimately to the benefit of society.

How then does research benefit teaching? It does so by placing the teacher at the forefront of knowledge in his field with the great merit of requiring him to be well read in a wide range of topics related to his subject. This first hand knowledge of his subject and his understanding of the relationship of it to other people's work will, I suggest, equip him better as a teacher than by reading of other peoples work in isolation. The critical and analytical thought processes that research demands will make him look at the material he teaches with fresh eyes - after all, is this not what we encourage our students to do - should we not also be able to demonstrate these abilities in ourselves?

There are, of course, other specific benefits which I will mention elsewhere in this paper, but I believe that the thought processes which research develops to be the most important benefits and also I might add, the most intangible. It is interesting to see how the attitudes which research develops can be brought to bear on other aspects of life in our departments such as course design, discussion of departmental and polytechnic policy and how such attitudes add to the quality of the environments of our departments.

nature of research

However, what I have said is conditional upon my answer to my next question - what should the nature of research be in our departments? We have seen much criticism in the press during the past year of research for its own sake and although it can be argued that such research has some value it is something that we can't afford and which is inappropriate to our work.

We should be very careful to guard against it in our departments.

Due to the lack of tradition in research in surveying there are many subjects needing attention which are directly relevant to the needs of our profession and associated industries and this is where we should direct our energies. This is not to say that there is no room for fundamental research in our disciplines but I think it is true to say that our work tends to take off from the fundamental research of other disciplines such as economics, the sciences and mathematics. In fact we are often applying applied research. This I feel follows the spirit of the CNAA regulations for registration which encourages the involvement of a sponsoring establishment to ensure a high level of application of the work undertaken. It is important to get this balance of applied and fundamental research right and to recognise that fundamental research requires the utmost dedication and perserverance and creates the greatest frustration as recognition of such work comes very slowly from our profession.

polytechnic research

Why should we in the polytechnics do research? The easy answer is because CNAA say so! Although I feel that their definition of research in their "Report of the Working Party on resources for research in polytechnics and other colleges" could be called into question even in a liberal research area such as surveying, the report nevertheless is well worth reading. The better, but rather pious, yet valid reason is that if we wish to offer degree courses, particularly honours degree courses, which should enable students to critically appraise the basis of our knowledge and, due to our lack of tradition in degree work and research, require honours courses to be at the boundary of that knowledge, we should be

able to demonstrate that we, as teachers, can do these things. We should be able to support our courses through our own efforts and not only through efforts of others.

research by surveyors

We are unique in having the freedom to research where our interests take us - in fact this is the only area in which we can effectively do research. Other professions and industries traditionally looked at their academics for research, why should not the surveying profession do the same?

It seems to me reasonable to expect teachers to want to be in this position.

Now that is all very grand, but can we do it? What abilities have we as professionally qualified surveyors to bring to bear on research?

The traditional disciplines require a candidate for research to have a good honours degree. As surveyors few if any of us have one. We do however, have a wealth of experience which in many cases is equally as valuable when coupled with the dedication and dare I say it, intelligence needed to pass the professional examinations. In addition we have "the mentality" of the surveyor which enables us to collect, collate and analyse data effectively and the ability to form valid and acceptable value judgements, plus a fair measure of commonsense. All this stands us in good stead when undertaking research. What we need to add is a dash of imagination, inspiration and flair. Put these ingredients together and apply them to research and a useful piece of work should result. It should be realised that research is 90% muscle and 10% inspiration - but 10% inspiration is indispensable. Well, then, if we have convinced ourselves that we are capable of research what are the problems we will have to face?

problems

Perhaps the greatest problem is "trying to beat the world" particularly when defining a research programme for M. Phil registration. Research has to accumulate slowly before some fortunate and perhaps inspired researcher is able to put all that went before him together to make a name for himself. Surveyors, particularly quantity surveyors tend to overestimate - it is a trait of their profession, this is well demonstrated in our world of education - we overestimated the ability of 'A' level students, our profession overestimates the ability of graduates, we tend to overestimate the rigour of a higher degree. Tough as these difficulties may be, they are surmountable and I sincerely believe that we have many people in the polytechnics who can make a valuable contribution to their teaching and the work of our profession, and get a great deal of satisfaction into the bargain, if they would get rid of their apprehension and undertake research.

A disadvantage we must recognise is our acceptability as researchers in the eyes of our colleagues from other disciplines with a traditional excellence in research.

This disadvantage is particularly prenounced if we have applications for registration considered by our own Polytechnics Research Degrees Committees whose members are of this background, we often have some hard talking to do in this situation. Again it can be a struggle when vieing for resources for research, but once we can show what we can make on impact with our work, and this is far easier for us in our area with its lack of research work, it is easier next time around.

The problem of registration can also be seen with CNAA panels in our fields. It may be said on some occasions that they suffer from the overestimation syndrome I mentioned earlier. Their attitude should, I believe, be to let the applicant have a try at research and not be ultra critical, although critical to a degree, at the registration stage. The examination stage should be the tough one.

A problem we must, I feel, accept is associated with our definition of the level of M. Phil degrees in our areas. CNAA define an acceptable M. Phil as "demonstrating competence in the investigation or critical study of his chosen topic and lucidity in the presentation of the results of his work" but our problem is that so little work has been done to draw upon that M. Phil theses in our areas tend to contain a large proportion of original material which take them part way to Ph. D and this in turn makes it difficult to define a Ph. D. level. No doubt this situation will be eased with the passing of time. A surveyor often needs a medal for devotion to duty simply for assembling the data he needs. He usually needs to be part Private Eye, part Salesman, and part Diplomat and to have sworn an Official Secret Act. This data problem is a very real one.

There are many other problems but I really only have time to mention one other and that is the availability of supervision. Things are improving as more surveyors gain higher degrees, but in the meantime it is well worth looking outside our own disciplines for supervision.

benefits

One would hope that there are some tangible benefits for all this effort. I have mentioned the benefits to the course and students and I will not repeat them except to point out that traditionally research work has supported honours degrees in the conventional disciplines. This situation has stood the test of time and is built on experience and I see no reason why it should not be true for surveying. Consequently one of the major questions asked by CNAA when considering honours courses is what is the level of research activity in the Department. There are however, other interesting and valuable benefits. Firstly, research helps to remove our professional blinkers and creates a greater recognition of the overlapping boundaries of our work between surveying disciplines and between surveyors and other disciplines. It enables members of our staff to develop national reputations in specific areas and we should not waste our opportunity to do this. This leads on to contacts with other staff in other polytechnics and universities and the profession and such contact must be good for education. It enables us to gain the respect of our colleagues in other Departments in our polytechnics and this again helps surveying. No doubt each researcher can point to specific benefits he gained but I think all researchers gain from the discipline of defining a programme, identifying constraints and parameters and working strictly within them, and last, but not least, the hard slog of writing up.

consultancy

My brief was to talk on "The Place of Research and Consultancy" and I must admit to having concentrated on the former and left myself with very little time for consultancy. However, I think this can be dealt with in a relative short time if I keep it within the context of improving the quality of our teaching. I should, however, start by making a point regarding research which has, I believe, connotations for consultancy.

This is, that research should be published and that unpublished research can in some cases be dangerous if embodied in teaching programmes. Research must be validated and what better way than by publishing in order to give a wide audience of the author's peers an opportunity to pass critical comment. I mention this because it could be said that consultancy by its nature passes this test, except that the public platform for criticism does not often exist. However, if a member of staff is commissioned to undertake a specialist piece of work, the merit of the consultants reputation and specialism should be evident in and valuable to his teaching work. I am of course, talking about someone with a specialist and relatively rare expertise and I do not think we yet have many staff in this category. I think that we will gradually have more staff of this nature and may well develop such skills following on from research programmes for such skills need experience and the time to devote to a specialist area. If staff do not come into teaching with them then I suggest they are likely to be developed through research.

I have been taking a rather narrow definition of consultancy and I should mention the wider definition, that of professional practice. How valuable to teaching is it? Without doubt it is of some value but we are up against the old story of Jones who went to see the boss complaining that Smith who worked next to him was paid more than him and Smith had only 5 years experience. Jones said he had 10 years experience and should be paid at least the same. To which the boss replied that he did not have 10 years experience but one year's experience 10 times over.

This is the problem of private practice as staff are often limited by time to the type of job they undertake and there arises a law of diminishing returns situation. Yet how does a lecturer keep up to date with market conditions, prices, etc? This is a difficult question which could benefit from further debate, certainly Ivor Seeley's suggestion about secondment to professional offices is an excellent one.* I mentioned the problem of time for professional practice - this I feel is very real. Teaching is a full-time job and I do not believe you can serve two taskmasters. Private practice always comes up at the wrong time and something has to suffer. This criticism may be levelled at research but in this case you are your own boss and can determine when and how much time you put in. The problem of time could be raised in connection with the first definition of consultancy and it could be a problem but the scale tends not to be so great. Such consultancy tends to be tidier and more in the nature of offering advice rather than accepting a piece of work with substantial long term time implications.

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*Mr Seeley made this suggestion in a paper also given on Conference 75/21.

I make these comments on consultancy guardedly as I am sure there are those better qualified than I to talk on controversial subjects such as this.

resources

What about resources for research in our departments? We are rather fortunate in this respect compared to many other departments in our polytechnics. Basically our requirements are for time or bodies and money principally for travel. We do not, fortunately, often have a great demand for expensive equipment. Our equipment needs often centre around the computer and this equipment is usually provided as a central polytechnic facility. We must recognise that it is not possible within staff/student ratios etc., to provide every member of staff with time to undertake research, but there again it isn't every member of our staff who wants to undertake research. With the right attitudes around the Department it should be possible to balance the time so that an acceptable number of our staff can devote some time to pursuing research.

Another need in this direction is for research assistants and with the current economic stringency we will have to look beyond the local authorities for the provision of funds for this purpose. A concerted approach to the SRC and SSRC may produce some results and the Association of Heads of Departments of Surveying have been discussing this possibility in conjunction with the RICS. We have to face particular difficulties in obtaining money for travel to pursue our research work. Traditionally research funds have been used to purchase equipment and the attitude that this is what research funds should be used for still stands in many of our polytechnics and perhaps even the Research Councils and we will have to be prepared to make very sound cases in support of our request for such funds. Again I feel that the climate is changing and with perserverance I think that the need to finance travel to pursue research will be more readily recognised.

There is also the vexed question of should consultancy and private practice undertaken in polytechnic time contribute funds for research? Until the professional indemnity insurance situation is faced and clarified by our polytechnics, I do not believe that any progress can be made in this direction, even if it was considered to be equitable, about which there must be some considerable doubt.

I have tried to paint a broad picture in a relatively short space of time and may be accused of overstating the case. If so it is because this aspect of our work in polytechnics is one of those I believe which needs the greatest attention, but I must stress that what we should be aiming for are balanced departments. If everyone was undertaking research we would be in a sorry mess, but if everyone can see the relevance of research then those with no desire to do research would have sympathy for its aims and realise that it was a necessary part of a healthy teaching environment. Perhaps then they would be content doing their bit, be it administration, a bit more teaching than the next guy or research because our business is about people, time and attitudes."

Mrs A M Ridler,
Senior Assistant
Registrar, Arts &
Social Studies,
CNAA.

CNAA AND THE POLYTECHNICS

historical background

"It will, I think, be helpful if I begin with some historical and factual background. When I first joined the Council's staff in 1969 only a few of the Polytechnics had been designated, and indeed the designation of the last of the 30, Preston Polytechnic only took place, I believe, about a year ago. One is conscious, therefore, of a long period of amalgamation and adjustment, in which some institutions, such as Lanchester and Portsmouth, had a head start, while others did not. Single site institutions also had an advantage. Those where two or three Colleges were merging, and where sites were sometimes many miles apart, had a much more difficult task ahead of them. All of the institutions had, and still have, building programmes creating a physical upheaval in their midst. All of the institutions were faced with discovering their identity and objectives as Polytechnics, building up their range of degree courses, adjusting to a considerable expansion in student numbers, and devising new structures of academic organisation. I am going to use the word metamorphosis later on - I suggest that this, for almost all of them, was the first metamorphosis, in the sense that after a period of transformation and travail new institutions emerged.

Compare the picture now in terms of enrolments on CNAA degrees with that in 1969/70:-

In 1969/70 there were 255 first degree courses in operation. I do not know what proportion was in what are now the Polytechnics, but I suspect it was well over 90% of the total. I think that at that time there were very few colleges other than Ealing Technical College and Bolton Institute of Technology, outside what one might call the proto-polytechnics.

The number of first year enrolments on these courses was 8,699.
The total number of enrolments was 19,960.

In 1973/74 the position was vastly different. There were 642 first degree courses in operation, of which 576 were polytechnic courses - the polytechnic share of the total was 89%.

The number of first year enrolments on these courses was 19,781, of which 15,996 were in polytechnics - 80% of the total.

The total number of enrolments was 49,309, of which 40,225 were in polytechnics, some 82% of the total.

This year, 1974/75, there are 775 degree courses running - three times as many as there were five years ago, and of these 629 are in polytechnics, which is 81% of the total. This proportion is down 8% on last year and I suspect this is the beginning of a trend.

The first year enrolments on first degree courses amount to 24, 931 - also three times the 1969/70 total - of which 19,463 are in polytechnics, and amount to 78% of the total. The proportion is only 2% down on last year, which suggests that although polytechnics now have a smaller proportion of the total of CNAA courses, the actual enrolments to the courses they have, have increased quite a bit.

The total enrolments on first degree courses this year amount to 59, 817, of which which 48, 188, or 81%, are in the polytechnics.

The net increase since last year in CNAA enrolments in polytechnics is just under 8, 000 students, which includes an increase of nearly 3, 500 in first year enrolments, or an average of more than 100 students extra per polytechnic. I said just now that the polytechnics had been faced with building up a range of courses and coping with expansion of numbers - I wonder how many in 1969 had really expected to treble the number of courses and undergraduates in a single quinquennium?

The balance between Science and Technology, Arts and Social Studies and other areas may also be of interest:-

Total enrolments this year in polytechnics were:-

for Science and Technology	23, 369, or 48.5% of the total
for Arts and Social Studies	18, 327, or 38% of the total
for Art and Design	5, 425, or 11% of the total
for Education	532, or about 1%
for the two College-wide modular programmes	535, or about 1%

If you add the figures for Arts and Social Studies to Art and Design, they are together approximately in balance with those for Science and Technology, probably for the first time. Bearing in mind that all Arts and Social Studies enrolments this year are 28% higher than last year, while Science and Technology only increased by 12% - and this is a fairly constant trend from year to year - it seems highly probable that Science and Technology will soon be in the minority. This, it seems, to me, adds force to that excellent title of the recent document of the Committee of Directors of Polytechnics - Many Arts, Many Skills - and personally I very much welcome this evidence of equilibrium - provided it does not trip over too far into an imbalance again.

I don't want to overburden you with figures but before I finish with statistics perhaps I could just round off the account with brief details for part-time degree courses and postgraduate awards:

81 of the 91 part-time degree courses are run in polytechnics;
77 of the 83 Master's courses are run in polytechnics;
28 of the 33 postgraduate diploma courses are run in polytechnics.

I suspect that in each of these categories the balance is more on the side of Science and Technology.

recent developments

The figures I have given speak for themselves about the recent growth in CNAA courses in polytechnics, and correspondingly in relations between the polytechnics and CNAA, but there are other points to add:-

The growth of arts and social studies courses has been extremely rapid, since it has not been spread over the whole life of the Council, which is now nearly 11 years old, and did not really begin to gather momentum until 1967. In terms of annual workload for subject Boards and Officers it amounts to a doubling of the number of courses considered every two years, whereas for Council as a whole the workload doubles approximately every three years. With this has come a tendency for the number of full-time courses to increase, and sandwich courses represent a declining proportion of the total. In this respect I have the impression that the technological universities have remained more faithful to the sandwich principle than the polytechnics. Indeed I can think of only one polytechnic which has carried adherence to the sandwich principle into relatively unusual areas such as Geography, because of its wish to consider supporting the sandwich idea.

There are other developments which may seem more in keeping with some people's notions of the distinctive nature of polytechnics - for example the great increase in the number of part-time courses, the growing interest in providing for adult higher education, as a counter-attraction, perhaps, to the Open University, greater interest generally in more mature students, and a consequent opening up of attitudes to entry qualifications. I hope that this movement will be helped by the more flexible provisions of Council's revised first degree regulations. It seems clear that whereas in the early days Council's work was seen as mainly for the 18+ age group, the whole situation has opened up in more recent years - a development which is surely to be welcomed. Whatever happens to the Russell Report, the movement to provide degree opportunities in a variety of ways for mature students has already started, and apart from the Open University, the bulk of this development is taking place in the polytechnics.

Another recent development to be highlighted is the beginnings of inter-institution cooperation. This has happened in a small way so far, with a joint postgraduate diploma course in Mechanical Engineering offered by a group of southern polytechnics, and a joint foundation course in Mathematics. There is also the joint part-time B.Ed. degree offered by a group of colleges in Hertfordshire including two Colleges of Education and Hatfield Polytechnic. I believe a joint part-time degree in Librarianship is also being planned by several Schools of Librarianship, and one hears of other ideas for linking institutions through their courses, not necessarily all of them polytechnics but sometimes with the polytechnic serving as a kind of focus. In one case, we have even approved a degree in which a year of the course operates at Surrey University.

One might link with developments of this kind the growing interest in polytechnic links with continental institutions, either through twinning arrangements and student exchanges, or through joint planning of courses in which students may rotate between 2 or even 3 institutions, say, in the UK, France and Germany. Unfortunately CNAA is to some extent restricted by its Charter from participating in these joint ventures, and some have got off the ground as College diploma courses rather than through CNAA largely because of this. I don't think anyone would want to see CNAA go international! - but I would certainly like to see a situation where we could be involved in validation of international ventures without having to impose restrictions concerning course control and the location of responsibility, simply because of the requirements of our Charter, which would go contrary to the spirit of genuinely cooperative international enterprises. In a sense, educational developments have outstripped the age for which the Charter was designed, back in 1964.

My last point concerning recent developments must be the diversification of awards, by which I mean the potential now existing for the development of a whole range of courses not necessarily leading to first degrees, and some of them at sub-degree level. It is of course much too early to say how the Dip. HE will develop, and whether it will take on. There is evidence that in other countries, two-year courses have proved popular. It will take time also to see how TEC and BEC fare and how their awards mesh in with those of CNAA. Discussions on the latter issue are already taking place between these Councils.

the effects of Circular 6/74

I want to say something about Circular 6/74 because it is of immediate concern to perhaps 25 of the 30 polytechnics. I am referring of course to the mergers now going through between polytechnics and colleges of education. Some of the implications are only now beginning to bite, and CNAA is already involved because of the effect of these mergers and of the policies adumbrated in the Circular on course development during the present year. First of all there are the institutional effects of the mergers. I am thinking especially of the problems of adjustment, in such cases as those of the polytechnics which already have a smallish department of education and are having to absorb a much larger college entity, sometimes with quite a different approach to teacher training. Some of the colleges merging have 1,000 or more potential graduate equivalent students. Then there is the problem of adding yet more sites to an institution which is already, perhaps, spread over several - with all the difficulties of coordination and unification that may involve. There will be problems of deployment of staff, which may throw subject departments in the polytechnic out of balance, and these may well bring with them acute student/staff ratio problems as well as the need for a massive programme of staff development and reorientation. All these difficulties must take time to resolve, and CNAA would certainly not expect otherwise. The major quinquennial review by Council, especially, must be seen as part of a dynamic process of interaction - even if to the recipients is seems at times rather more like vivisection!

Some of the effects on course development are already obvious, and one wonders how desirable they are: yet more growth in "liberal arts" type courses, for instance - do we really need to multiply large numbers of rather similar Combined Arts courses? should they really all be modular? - despite the recommendations in Circulars 7/73 and 6/74. Do we really want a situation where polytechnics are virtually compelled to offer a new modular Arts course sidy by side with a successfully running non-modular Humanities course? Is it really desirable to call into being new degree courses leading to B.A awards which because of the requirements of the Circular are no more than souped-up B.Ed courses minus the professional teacher training content? Is it really feasible to devise degree programmes of acceptable standards simply by tacking on a third year to a two-year Dip HE course? I could go on, but won't: I would just say however that the situation where an institution is duplicating courses because of circumstances beyond its immediate control is familiar to us from the early days of the polytechnics, when institutions coming together found that they had two Mechanical Engineering degrees, or two Business Studies degrees - an anomalous situation no one would want to perpetuate

Other effects of the Circular may well be an acceleration of Dip HE developments, an increase in modularisation of courses, and of course a much wider involvement of polytechnics in education courses than was ever possible when there were only eight polytechnic departments of education. One hopes that one consequence of this might be a growing interest in the training of teachers for work in FE or in HE in the polytechnics, and more effective in-service training for polytechnic staff. Some polytechnics are already developing a service on these lines.

Perhaps one of the best features of these new developments, difficult as they may seem when one is living through them, is that they are making for the emergence of the polytechnics, through this second metamorphosis, as much more balanced institutions than they have ever been before, and hence more satisfying for students and staff as academic communities. One returns again to the Many Arts, Many Skills idea. In their first metamorphosis many of the polytechnics absorbed Colleges of Art and the recent NCDAD/CNAA merger has completed the process by rationalising the award system. Now that education is being absorbed so widely into polytechnic institutions as well, the polytechnics can genuinely claim to be much more comprehensive than most universities - comprehensive both in the range of subjects and inter-disciplinary combinations covered, and in provision for sub-degree as well as degree courses, part-time as well as full-time. On top of this, however, unlike most of the universities, they have to cope with complex multi-site operation, relative deprivation of resources, a still expanding situation. Can they do it all? Perhaps this question is one for you to answer.

matters of concern to CNAA

I would like to move on now to the theme of matters of concern to CNAA, using the word "concern" not to mean, as it often does, "disapproval" or "censure", but "concern" for the polytechnics, and concern especially for the welfare of the staff and students in them.

First, concern about preservation of standards. There is great anxiety, shared by Board members from universities and from polytechnics and other institutions, that the rapid proliferation of course, particularly in Arts and Humanities, will not endanger the standards that have been built up in the polytechnics, in other words that standards will not slide. It is for this reason that the Combined Studies (Humanities) Board, for instance, has been taking increasingly stringent and unpopular decisions. If we saw a downward slide in standards as more and more compromises were made, on staffing, library provision, technical support, research facilities, this could only damage the esteem in which existing courses are held. It is worth noting that although the Charter talks about comparability of standards with university courses, the standards of existing well-established polytechnic courses are also a normal point of reference for CNAA subject Boards.

Next, concern about morale. Thinking back to the period around 1972 and the publication of the White Paper on Education: A Framework for Expansion, one is very conscious of the optimism in the air at that time. The future really did seem to offer reasonable hopes of progress, student numbers were rising, there was a feeling of buoyancy about the upsurge in new course developments. Since then the economic situation has radically changed the picture as we all know. Cuts and restrictions have damped ardour; too many innovations seem enforced by dire necessity; there have been severe problems with delayed building programmes, and in the human problems of staff reorientation and redundancy as the requirement to conform to Delaney norms has bit deeper; problems also of declining student demand in sciences, engineering, languages. Small wonder that morale has declined, and the crusading, pioneering spirit has rather evaporated.

This leads to my next point, which is concern that there shall not be undue restraint on initiative on innovation. I have already referred to the restrictive effects of Circular 6/74 on courses originating in colleges of education. This is just a personal view but it seems to me important that polytechnics should have a measure of freedom and flexibility to dispose of the resources available to them in the way they consider best. It is a little worrying that modularisation on a college-wide basis may restrict over-much new thinking on course structures and teaching methods among particular sectors of polytechnic staff, by imposing a single administrative framework for all subject contributions. It is also worrying that modularisation may restrict inter-disciplinary developments, which do not necessarily fit well into a modular structure. It remains to be seen how far polytechnics will envisage the development of new courses which do not fit into existing college-wide modular programmes. There is also the fact that in many cases CNAA has a heavy workload of courses which are not innovatory but are merely a restructuring of existing material, devised solely to rescue departments with too few students.

Then there is concern that if CNAA is to be responsible for the development of new awards, such as the new B.Ed. and the Dip.HE, they get off on the right foot, and are treated with all the care for standards characteristic of degree validation. Here we are still in the early stages of lifting up experience and case-law.

Finally - or at least, the last point I propose to make on this theme - concern that polytechnics are equipped in the fullest sense to cope with student welfare. This means pastoral and academic counselling - and it has to be remembered that many new modular courses are of such complexity that they require complex counselling services - concern for academic progress, which means also concern about the kind of experience the course a student is taking is for him or her. We often find, talking to students, how they feel the lack of a home base in the polytechnic, or the lack of continuity of contact with staff, or an inadequate sense of identity with a particular course. The whole area is one to which Council is increasingly giving attention.

polytechnic "freedom"

Turning to the issue of polytechnic "freedom", I deliberately put the word "freedom" in inverted commas. I know people will expect me to say something about it, and I will gladly answer questions, though as the discussion paper being prepared on this subject is under active consideration by Council, I don't feel very free at this stage to expand on it. When the paper I have mentioned is approved by Council, it will be circulated to all institutions for comment, and perhaps after that will be the time to discuss it on occasions such as this. What I would like to suggest is that there are valuable aspects of polytechnic experience, and of subject Board experience of polytechnic courses, which I for one would be very loth to lost. I believe that if we lose too much contact with what is "best practice" in the polytechnics, we also lose a very valuable means of assessing degree in less experienced institutions. I hope very much that whatever solutions are reached will preserve some elements of continuous dialogue between the polytechnics and CNAA, so that it is not merely a matter of a "big bang" experience every 5 years.

polytechnic objectives

This leads to my final point. CNAA is very much bound by what the polytechnics see themselves as being and becoming, because the objectives of the polytechnics, in so far as they consciously have them, inevitably condition the types of courses submitted to Council. Some, but not all, have an explicit policy emphasising the distinctness of their character from that of universities, the applied nature of their work, their vocational purpose, their contacts with local industry and concern for community needs. How does all this square with the college-wide modular programme, and to what extent is the decision to go modular an administrative convenience or founded on educational principle in terms of new approaches to teaching method? To what extent do the polytechnics wish to maintain their strength in certain areas of specialist and professional education and training where they have proved their excellence - and are these goals compatible with the single polymodular programme? Have the polytechnics gone overboard for multi-disciplinary degrees as a matter of principle in too big a way and hence diluted their strength in areas of specialist and professional education? How do they interpret CNAA's requirements for a balanced educational experience? Just in terms of a general studies programme? Or much more

through an attitude to teaching the subjects of the degree course itself? To what extent are staff encouraged to explore inter-disciplinary studies, or to develop new disciplines, as is beginning to happen, for instance with communication studies? It is possible that inter-disciplinary developments could be one of the most distinctive contributions polytechnics could make to higher education, but such innovation demands reasonable elbow-room for individuals to develop their ideas and generate enthusiasms.

* * * *

With luck, between 1980 and 1984, most of the polytechnics will at least be occupying their long delayed new central site buildings, having played unwillingly at Snakes and Ladders from Phase to Phase of their building programmes. One hopes that this can be the period of real consolidation, when the grass is at last growing where once was a sea of mud and rubble - one hopes also a period of, as I suggested earlier, a continuing dynamic relationship with the Council, and a time for polytechnics to develop their own critique of where they got to in the 1970's. One wonders, for instance, what the optimum growth in numbers of courses really is, what the student enrolments will really look like, what proportion of the age-group by then will be in higher education, what will have happened to the sixth form curriculum and examinations.... But here I'd better stop! "

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